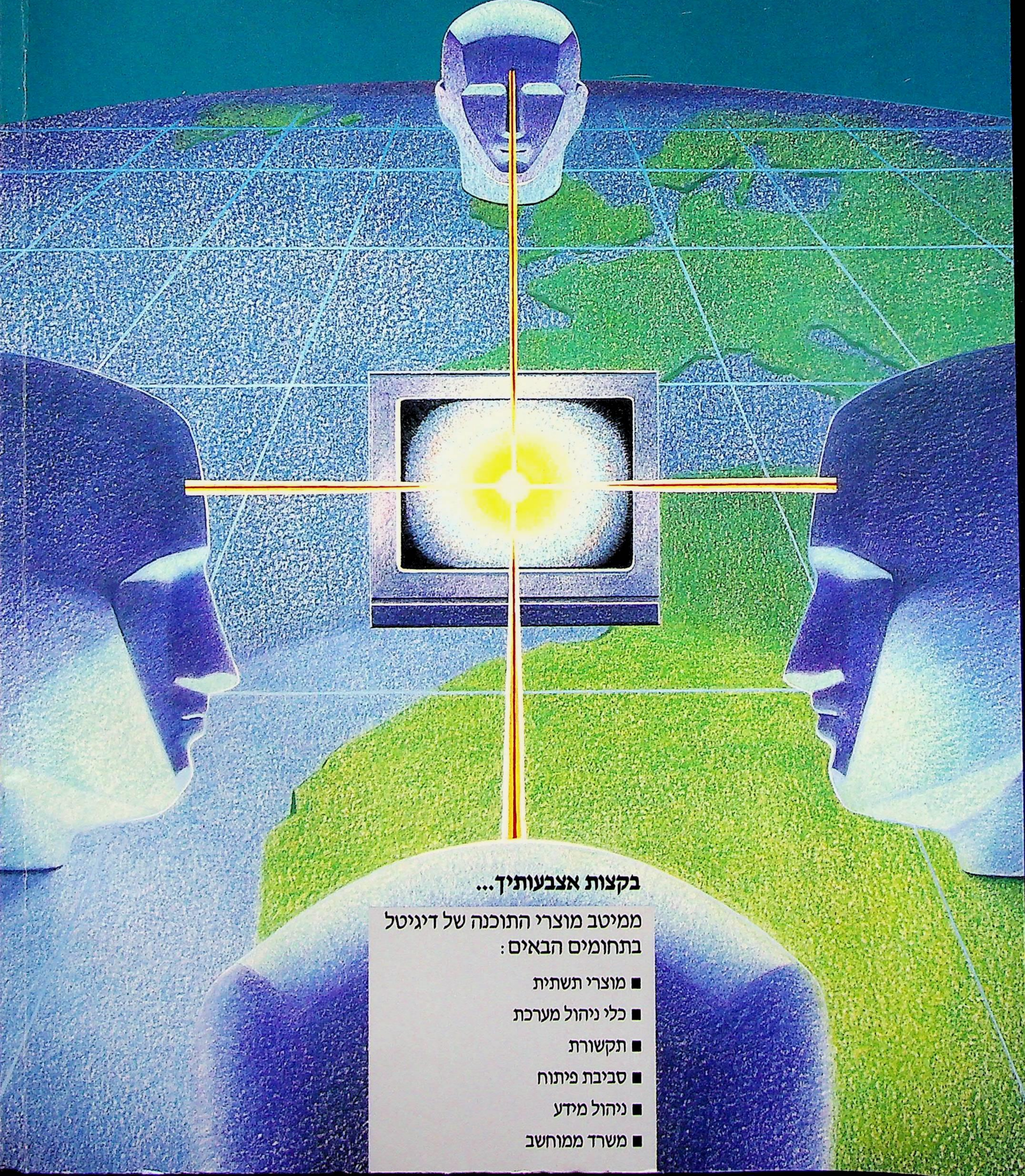
DECdirect

digital

מוצרי תוכנה



בקצות אצבעותיך...

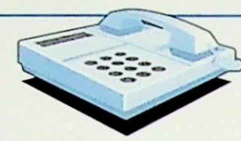
ממיטב מוצרי התוכנה של דיגיטל בתחומים הבאים:

- מוצרי תשתית
- כלי ניהול מערכת
- תקשורת
- סביבת פיתוח
- ניהול מידע
- משרד ממוחשב

מידע להזמנות

איך להזמין?

בטלפון



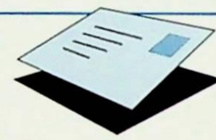
177-022-54000

בפקסימיליה



052-544758

בדואר



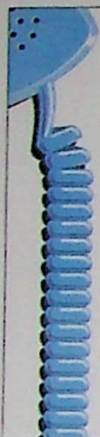
דיגיטל אקוויפמנט (דק) בע"מ
בית דיגיטל, צומת אכדיה
הרצליה 46733, ישראל
ת.ד. 2033, הרצליה 46120

טבלת עזר לקידוד CPU: טבלאות אלו מאפשרות גישה נוחה ומהירה לקודי ה-CPU ו/או דירוג נקודות אשכול המחשבים שברשותך. לפירוט נרחב יותר של השימוש בקודים אלו, פנה לדפי העזרה בעמ' 5

VMS ClusterWide, Traditional and ULTRIX CPU ratings

CPU	CW Points	CW Code	Trad Code	ULTRIX Code
VS2000, VAXsrv3100	10	B	R	R
VS II	10	B	Q	Q
VS3xxx, 8000; VAXsrv 3xxx, 4000	10	B	C	C
MV2000, 3100	20	C	P	P
MV II	50	D	N	N
VAX 730	50	D	M	M
VAX 750	100	E	L	L
VAX 78x	100	E	K	K
MV3300, 3400	100	E	S	S
VAX 82xx	100	E	J	J
VAX 83xx; VAXsrv 6000-210/310	200	F	H	H
MV3500, 3600, 3800, 3900	200†	F	B	B
VAX 6000-210/310; VAXft 3000-310; VAX 4000	300	G	2	2
VAXsrv 6000-220/320/410/420/510/520; VAX 8500, 8530	400	H	G	G
VAX 86xx	400	H	F	F
VAX 8550, 8700, 8810	600	J	E	E
VAX 6000-410, 6220, 6320; VAXsrv 530/540/550/560	600	J	3	3
VAX 6000-230/330/510	900	K	4	4
VAX 6000-240/340/350/420, 8800, 8820	1200	L	D	D
VAX 6000-360/430/520, 8830	1800	M	U	U
VAX 6000-440/450/460/530/540/550/560, 8840, 8842, 8974, 9000-210/410	2400	N	V	V
—	3600	Q		
VAX 8978, 9000-420/430/440	4800	S	5	5
—	6000	T		
—	7200	U		
—	9000	V		

סיוע טלפוני



קבוצות המכירות והסיוע בטלפון הן כאן לעזרתך - וזאת במרחק של שיחת טלפון אחת בלבד ממך.

בירורים להזמנות/מחירים
177-022-54000

בירורים בנושאי מוצרי תוכנה
052-593142

בירורים בנושאי תמיכת תוכנה
052-593300

אספקה מהירה -

ללא חיוב נוסף רוב מוצרי התוכנה המוזמנים מ"דיגיטל ישירות" יסופקו בארץ בתוך 20 יום מיום ההזמנה. כל זאת ללא חיוב נוסף.

✓ 20 יום

Software Warranty

כל מוצרי התוכנה של דיגיטל כוללים שנת אחריות. ברוב המקרים אחריות זו כוללת תמיכה טלפונית, הניתנת באמצעות מחלקת תמיכה טלפונית, הניתנת באמצעות מחלקת תמיכת התוכנה בדיגיטל הכוללת כ-30 מומחי תוכנה מהשורה הראשונה.

מכירה בשקלים

כל מוצרי התוכנה של דיגיטל ניתנים לאספקה מקומית בתשלום שיקלי. לאור מדיניות המיסוי הקיימת כיום מחירים אלו גבוהים רק ב-4% בממוצע מהמחיר F.O.B.

ULTRIX/RISC CPU Letter Codes

DECstation 2100, 3100	A
DECstation 5000 Model 200	C
DECsystem 3100, 51000	N
DECsystem 5400, 5000, 5500	S
DECsystem 5810	2
DECsystem 5820	3
DECsystem 5830	4
DECsystem 5840	D

digital

לקוח יקר:

אנו מתכבדים להעביר לך את המהדורה הראשונה של קטלוג מוצרי התוכנה של דיגיטל ישראל.

בתוך עמודיו של הקטלוג תמצא את מגוון התוכנות המותאמות לצרכיהם של משתמשים סופיים, מפתחי תוכנה ומנהלי מערכות ורשתות.

דיגיטל מאמינה כי ככל שהביקוש ליישומים חדשים עולה, וזאת במקביל לפיתוח והצגה של טכנולוגיות חדשות, ארגונים נדרשים לאסטרטגיה שתנצל בצורה הטובה ביותר את משאבי התוכנה והמיומנות בארגון, וזאת מקשת רחבה של מקורות: פיתוח עצמי, בתי-תוכנה עצמאיים ומשווקי מערכות.

האסטרטגיה שלנו היא לספק ללקוחות סביבת מיחשוב המבוססת על הסטנדרטים הקיימים בתעשיה, כך שיתאפשר ללקוחות להפיק את המירב והמיטב מסביבת יישומים ופיתוח המשותפת ליצרנים שונים.

קטלוג זה עצמו הופק תוך כדי שילוב של טקסט וגרפיקה ממגוון פלטפורמות ופלטים; (output) ממספר מחשבי ויישומי VMS, UNIX ו-APPLE ששולבו כולם יחדיו למוצר זה שאתה מחזיק בידיך כעת.

למידע, או ייעוץ לגבי הנ״ל, או לגבי כל היבט במוצרי התוכנה של דיגיטל, התקשר אלינו עוד היום בטל׳ 052-593142.

כתמיד, נשמח לשרת אותך בנאמנות.

יעקב אורן
מנהל
דיגיטל ישירות

עדי אייל
מנהל תחום מוצרי תוכנה

בקטלוג זה...

בקטלוג זה נמצאים מוצרים כמעט בכל תחום: מערכות הפעלה, ניהול בסיסי נתונים, שילוב מיחשוב אישי, מערכות למשרד ממוחשב, תוכנות לפיתוח ותחזוקת תוכנה ועוד.

Contents

◆ New Product

4

Office applications

5

Development environment

6

Information management

7

Manufacturing and Realtime

How to use the price tables.

PACKED WITH INFORMATION TO MAKE ORDERING EASY.

1 Product name. Is it ALL-IN-1 or ALL-IN-1 Starter that you're ordering? This reminder of the product's formal name can help minimise ordering errors.

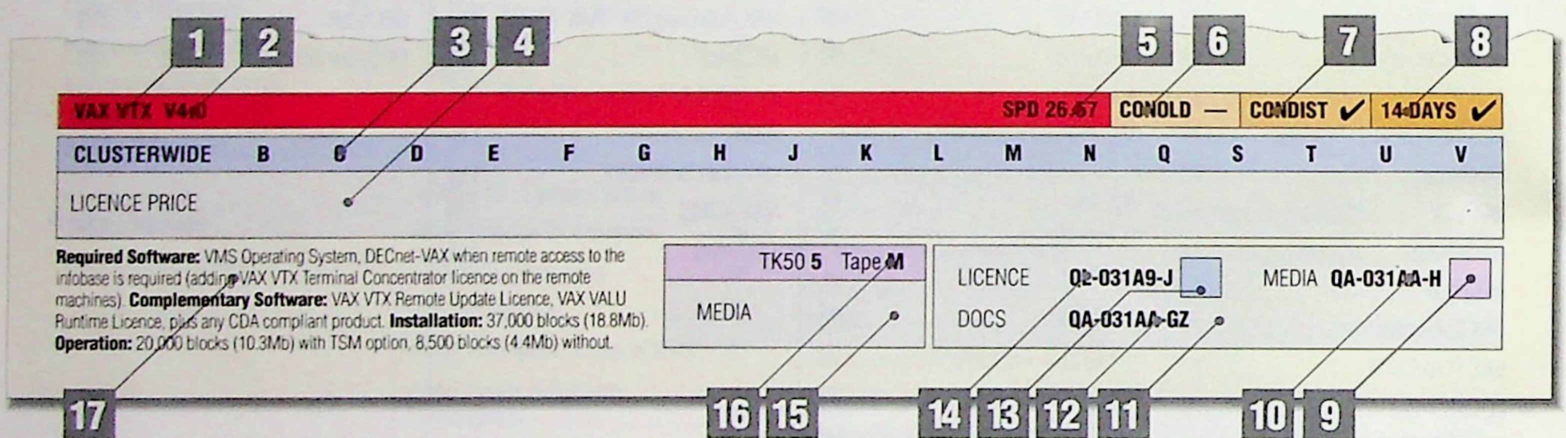
2 Version number. This is the version of the software that was the current release at the time this catalogue went to press. For the latest update, just call DECdirect. By default, we ship the latest version.

7 CONDIST availability. If ticked, this box indicates that the product is available on CD-ROM as part of our CONsolidated DISTribution kit. For further information, please see article on *Compact Disk Distribution* in these Help File pages.

8 14-day availability. If ticked, this box indicates that the product is a fast-ship item and can be delivered to you within 14 days of order. If not ticked, allow up to 28 days for delivery, subject to confirmation.

14 Software Licence part number. This is the part number identifying the software: be sure to quote it when ordering. The part number is not complete without its suffix letter: see item 13.

15 Media Kit price. This is the price of the media kit for the relevant software in pounds, rounded up to the nearest pound, excluding any discount and Value Added Tax.



3 ClusterWide Rating code. This is a single-letter code representing the points value of your VAX or VAXcluster. For guidance on working out your ClusterWide Rating Code, please see *ClusterWide: A licence to save money* in these Help File pages.

4 Licence price. The price below your ClusterWide Code Letter is the price of the software licence: you will also require a media kit in most cases (see items 15 and 16). The price is rounded up to the nearest pound. It excludes any discount and Value Added Tax.

5 SPD number. The SPD (Software Product Description) number identifies a document that gives the legal specification to which a single software product conforms. If your software doesn't conform to these specifications, we'll fix it or provide a refund. Just phone or fax for a copy of a specific SPD.

6 CONOLD availability. If ticked, this box indicates that documentation for the product is available on CD-ROM as part of our CONsolidated On-Line Documentation kit. For further information, please see article on *Compact Disk Distribution* in these Help File pages.

9 Media Kit code suffix. When you copy your Media Kit code letter (either '5' or 'M') into this box, it completes the Media Kit part number, uniquely identifying the media requirement for your VAX or VAXcluster.

10 Media Kit part number. This is the part number identifying the media kit on which the software will be supplied: be sure to quote it when ordering. The part number is not complete without its suffix letter: see item 9. All media kits come with one complete set of documentation and the load media of your choice

11 Documentation price. This is the price of a full documentation set for the product, in pounds, rounded up to the nearest pound, excluding any discount and Value Added Tax.

12 Documentation part number. This is the part number you should quote when ordering documentation for the product.

13 ClusterWide Rating code suffix. When you copy your ClusterWide Code Letter into this box, it completes the Software Licence part number, uniquely identifying the licence for your VAX or VAXcluster.

16 Media Kit code. Once you've purchased a licence for a specific piece of software, installation takes place using a media kit. DECdirect typically sells software on either TK50 tape cartridge (code '5') or 1600 bpi magtape (code 'M'): the code is used to indicate your requirement (see item 10).

17 Related information. This space is typically used to present additional information on complementary products and hardware/software requirements.

Other price tables:
Shown here is the price table format for ClusterWide licences, the most common type in this catalogue. Non-ClusterWide products use slightly different price table formats — but the principle is the same. See facing page for details.

Prices quoted here are for example only: please see current prices in this catalogue.

VAX Message Router/P (PROFS) V1.1	SPD 28.94	CONOLD ✔	CONDIST ✔	14 DAYS ✔

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

TK50 5 Tape M				
MEDIA	LICENCE	QL-VCGA -AA	MEDIA	QA-VCGAA-H
	DOCS	QA-VCGAA-GZ		

Traditional licences
Similar to the ClusterWide table, except that there are 22 letter codes and prices in the Traditional table and these relate to individual CPUs instead of ClusterWide points totals. For a list of CPUs and their associated letter codes, see the inside front cover of this catalogue. For easy identification, Traditional price panels are colour-coded pale orange.

ULTRIX Mail Connection V1.1	SPD 28.94	CONOLD –	CONDIST ✔	14 DAYS –

VAX ULTRIX	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

TK50 5 Tape M				
MEDIA	LICENCE	QL-VFGA -AA	MEDIA	QA-VFGAA-H
	DOCS	QA-VFGAA-GZ		

VAX ULTRIX licences
Here too there are 22 letter codes and prices and, like the Traditional table, these relate to individual CPUs. For a list of CPUs and their associated letter codes, see the inside front cover of this catalogue. For easy identification, VAX ULTRIX price panels are colour-coded pink.

DEC GKS-3D for ULTRIX/RISC V1.0	SPD 30.93	CONOLD ✔	CONDIST –	14 DAYS –

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

TK50 5 Tape M				
MEDIA	LICENCE	QL-VX1A -AA	MEDIA	QA-VX1AA-H
	DOCS	QA-VX1AA-GZ		

ULTRIX/RISC licences
Here there are 8 letter codes and prices relating to individual CPUs. For a list of CPUs and their associated letter codes, see the ULTRIX/RISC table on the inside front cover of this catalogue. For easy identification, ULTRIX/RISC price panels are colour-coded green.

ALL-IN-1 V4.2	SPD 27.30	
PERSONAL LICENCE per 4 named users		
CONOLD ✔	CONDIST –	14 DAYS –
LICENCE	QL-AAAE9-QD	
MEDIA	QA-AAAEA-H	

VAX Notes V2.0	SPD 27.06	
USER BASE LICENCE per 4 users		
CONOLD ✔	CONDIST –	14 DAYS –
LICENCE	QL-960A9-PD	
MEDIA	QA-960AA-H	

DECdecision V1.0	SPD 25.62	
CONOLD ✔	CONDIST ✔	14 DAYS –
LICENCE	QL-VW3A9-PB	
MEDIA	QA-VW3AA-H5	

Personal licences
A Personal licence allows four named users to use the software. If you require more than four named users, you need to purchase additional Personal licences, each of which covers another four named users. The Media Kit part number and price are the same as that shown in the main price panel for the product. For easy identification, Personal licence price panels are colour-coded yellow.

User Base licences
A User Base licence allows *any* four users (as opposed to four named users) to use the software at the same time. If you require more than four users, you need to purchase additional User Base licences, each of which enables another four users to use the software at the same time. The Media Kit part number and price are the same as that shown in the main price panel for the product. For easy identification, User Base licence price panels are colour-coded light blue.

Single licences
Some Digital software products cost the same irrespective of number of users or CPU power. Such products are covered by a Single licence. For easy identification, Single licence price panels are colour-coded red.

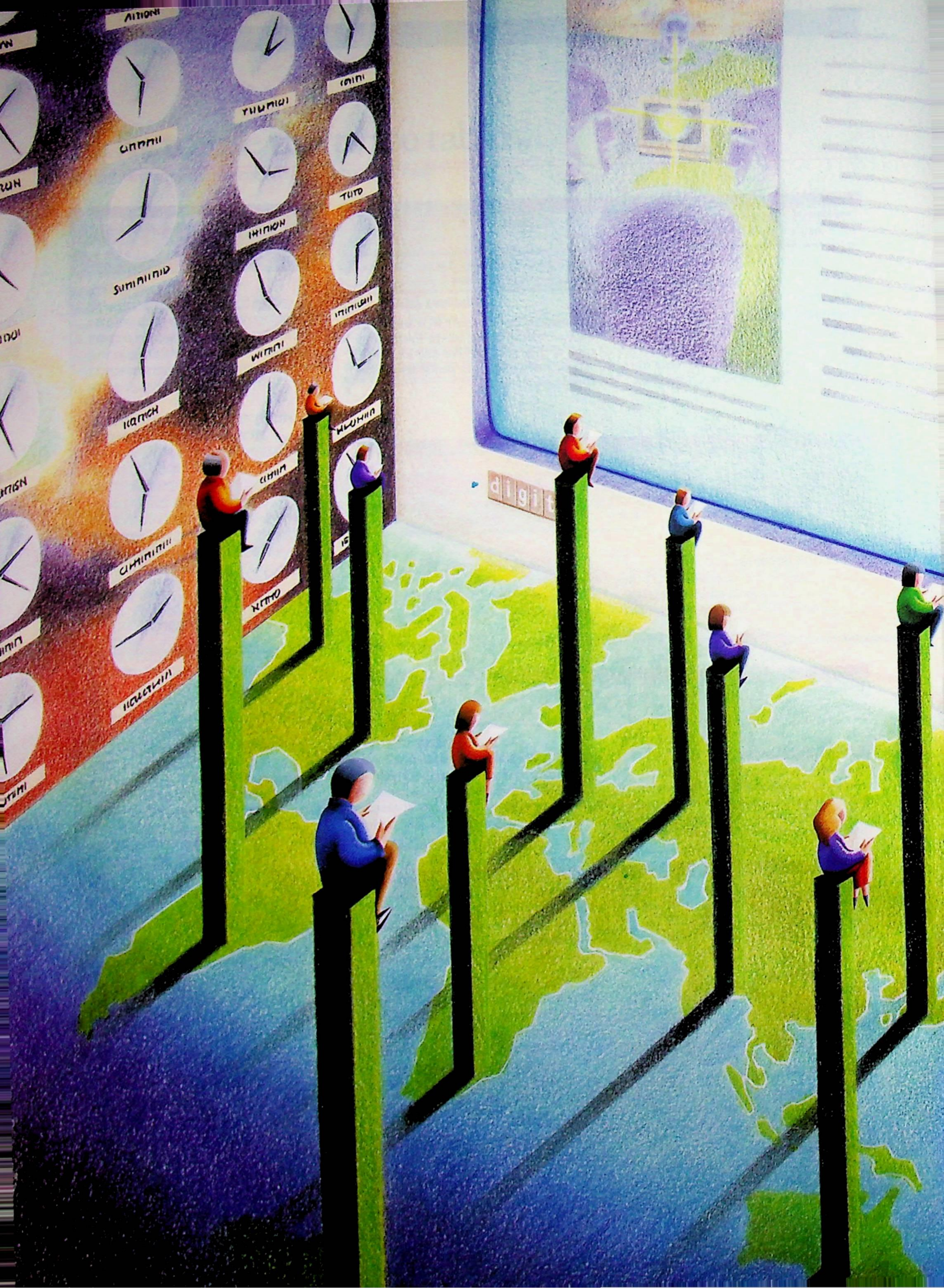
מדיניות דיגיטל לרישוי תוכנה

אחד מהנכסים בעלי הערך המשמעותיים ביותר של כל חברה הוא הידע הייחודי של "קניין רוחני". במקרה של דיגיטל, תוכנה היא חלק מרכזי מאותו "קניין רוחני", והמנגנון בו אנו משתמשים להגן עליו (ולהחזיר את ההשקעות הנכבדות בפיתוח תוכנה) הוא רישוי תוכנה.
אתה הלקוח לא רוכש מוצר תוכנה מדיגיטל. אתה רוכש את זכות השימוש בתוכנה. רישיון התוכנה מעניק לך את הרשות להשתמש בגירסה ספציפית של מוצר התוכנה, וזאת בהתאם לתנאי הרכישה הסטנדרטיים. תנאים אלו מאפשרים להשתמש במוצר ע"י חברה מסויימת על מערכת מחשב מוגדרת מראש.

רישיון + מדיה = תוכנה

עם מתן הרשוי, אתה זכאי להשתמש במדיה (H-KIT) להעלאת והרצת התוכנה על המערכת המורשית לשימוש.
הקיט עצמו כולל את המדיה שעליה התוכנה, ועותק אחד של ספרות.
לפיכך במרבית המקרים, הזמנה למוצר תוכנה של דיגיטל נדרשת לשני פריטים: פריט הזמנה אחד לרישיון הרלוונטי, ואחד למדיה (H-KIT).
לעיתים, דיגיטל כוללת רישוי לתוכנה מסוימת במסגרת פריט חומרה. או לעיתים, במקרה של מחשבים אישיים פריט אחד יכלול גם את רישוי התוכנה וגם את המדיה עצמה, בחבילה אחת.
אבל, עדיין ברוב המכריע של המקרים, רוב פריטי התוכנה המופיעים בקטלוג זה דורשים שני פריטים (part numbers). במקרים שונים מאלו יובא הדבר לידיעתכם.

Prices quoted here are for example only: please see current prices in this catalogue.


digit

ClusterWide: a licence to save money

...EVEN ON STANDALONE CPUs!

There used to be a time when the only way to use Digital VMS-based software was via a 'traditional' licence, where a separate licence was required for each CPU.

Now, however, there's a better way — brought about by the rapid growth of the VAXcluster concept. VAXclustering brings increased system performance, more efficient use of resources, and simplified system growth... and with these benefits comes a whole new licensing concept designed to maximise the return on your software investment.

With traditional licensing, the cost of converting your VAX system to a VAXcluster, or of expanding an existing VAXcluster, is based on a 'one licence per CPU' basis; each computer in the cluster has a separate licence. With the new ClusterWide licences, however, you buy a *single* licence for the VAX or entire VAXcluster — and that brings big savings.

You may also, if you wish, purchase ClusterWide licences to run on selected individual CPUs in a VAXcluster for maximum flexibility.

The Points system.

The cost of a ClusterWide licence is directly related to the power of the VAX configuration on which the software will be run. We've assigned a points value to each type of VAX CPU (see the CPU Points Ratings table below); by simply adding up the points assigned to each CPU in your cluster, you end up with a points total which then dictates the cost of the software licence for that configuration.

The ClusterWide licence points values move up in bands. All you have to do is purchase the matching points value (or, if you fall between two bands, the next highest points value). There's no premium attached to a ClusterWide licence, either: in most cases, it costs the same as a traditional, separate licence on a standalone VAX of the same power.

When you expand your configuration with new hardware, your investment in software licences is protected: you need only purchase an upgrade from your existing points total. So the more you grow, the more money ClusterWide licensing saves you.

The future is ClusterWide.

ClusterWide licensing opens up the power and benefits of VAXclustering at the least possible cost. And experience suggests that ClusterWide licensing can bring big savings on software maintenance prices as well. So, whether you measure the benefits in terms of performance or cost, it really does make sense.

ClusterWide licensing is available on many common VMS software products. VMS V5.0 is not required, which means that you can take advantage of ClusterWide licensing even if you're running earlier versions of VMS.

Using CW Licence Codes

1. Calculate your cluster's points rating.

There's a points value assigned to each VAX CPU type in your VAXcluster. Simply add these up to arrive at the points rating for your cluster as a whole.

Example:

Take a VAXcluster made up of the following CPUs:

CPU	Points value	Number in cluster	Total
MV II	50	8	400
VAXsrv6000-310	200	2	400
		Points total for Cluster	**800**

The CPU Points Ratings table provides us with the points value associated with a MicroVAX II (50 points) and a VAXserver 6000-310 (200 points). Multiply these ratings by the number of such CPUs, and you arrive at the ClusterWide points total for the VAXcluster... 800 in this case.

Next, turn the points total into the appropriate ClusterWide Code Letter. A glance at the ClusterWide Letter Codes table shows that there is no exact match for our points value, so we simply choose the next highest points value — 900 — and read off the ClusterWide Code Letter, which is K.

The ClusterWide Code Letter stays constant for a given VAXcluster, and does not need to be re-computed until you add more CPUs to your VAXcluster.

CPU Points Ratings

1 CPU	2 POINTS PER CPU	3 Nº IN YOUR CLUSTER	4 POINTS SUBTOTAL (col 2 × col 3)
VS2000, VAXsrv3100	10		
VS II	10		
VS3xxx, 8000; VAXsrv 3xxx, 4000	10		
MV2000, 3100	20		
MV II	50	8	400
VAX 730	50		
VAX 750	100		
VAX 78x	100		
MV3300, 3400	100		
VAX 82xx	100		
VAX 83xx; VAXsrv 6000-210/310 MV3500, 3600, 3800, 3900	200	2	400
VAX6000-210/310; VAXft 3000-310; VAX 4000	300		
VAXsrv 6000-220/320/410/420/510/520; VAX 8500, 8530	400		
VAX 86xx	400		
VAX 8550, 8700, 8810 VAX 6000-410, 6220, 6320; VAXsrv 530/540/550/560	600		
VAXsrv 6000-230/330	900		
VAX 6000-240/340/350/420/510, 8800, 8820	1200		
VAX 6000-360/430/520, 8830	1800		
VAX 6000-440/450/460/530/540/550/560, 8840, 8842, 8974, 9000-210/410	2400		
—	3600		
VAX 8978, 9000-420/430/440	4800		
—	6000		
—	7200		
—	9000		

Total for your Cluster = 800 (Total of Col 4)

ClusterWide Letter Codes

If your cluster's Points Total is...	10	20	50	100	200	300	400	600	900	1200	1800	2400	3600	4800	6000	7200	9000
Your ClusterWide Letter Code is...	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V

2. Use the ClusterWide Code Letter to identify the cost of the software and media kit.

Each ClusterWide-compatible product has its own ClusterWide price panel, with 17 different prices corresponding to the 17 different ClusterWide Code Letters.

ClusterWide Letter Codes

If your cluster's Points Total is...	10	20	50	100	200	300	400	600	900	1200	1800	2400	3600	4800	6000	7200	9000
Your ClusterWide Letter Code is...	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

	TK50 5	Tape M
MEDIA		

In this example, the cost of the licence for our cluster is £44,660. The Media Kit costs £744 on TK50 cartridge, irrespective of cluster size.

When your points total falls between two bands, use the next highest band. E.g.: 380 points is treated as 400 points, Letter Code 'H'. The extra points can be used immediately should you wish to add workstations or a CPU of the remaining points value to your configuration, without a further software purchase being necessary.

3. Complete the Part Number before ordering.

When you order, your ClusterWide Code Letter is an essential component of the Part Number.

In this example, the full Part Numbers are:

Licence QL-031A9-J**K**
Media QA-031AA-H**5** (TK50 cartridge)

LICENCE	QL-031A9-J K	MEDIA	QA-031AA-H 5
DOCS	QA-031AA-GZ		

Prices quoted here are for example only: please see current prices in this catalogue.

Growing the ClusterWide way.

The price panels in this catalogue show the cost of buying a ClusterWide licence for software for the first time. If you've already purchased a ClusterWide licence for a piece of software, and now wish to extend the licence to cover new CPUs added to the cluster, you can work out the cost of upgrading from your current ClusterWide points rating by using the table below.

To compute the approximate cost of the licence upgrade:

1. **Look up the 10 point licence ('B') price of the software in its own price table.**
2. **Select the current points value of your configuration (or, if no match exists, pick the next smaller points value) in the vertical 'From' bar. Trace across the row, stopping when you are under the 'To' points value (if no exact match exists, pick the next greater points value).**

Note the multiplier value of the intersection of the 'From' and 'To' points values.

3. **Multiply the results of steps 1 and 2, and you have your approximate upgrade cost.**

From (existing points)	To	10	20	50	100	200	300	400	600	900	1200	1800	2400	3600	4800	6000	7200	9000
	NEW LICENCE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
0 (New)	QL-UPIA9-J□	1.00	1.99	2.82	3.97	6.63	9.28	11.00	14.57	17.38	20.15	25.72	28.89	35.26	41.63	47.99	54.35	63.89
10	QL-UPIAQ-U□	→	0.99	1.78	2.97	5.63	8.28	10.00	13.57	16.37	19.15	24.72	27.89	34.26	40.63	46.99	53.35	62.89
20	QL-UPIAP-U□		→	0.80	1.99	4.64	7.29	9.01	12.58	15.39	18.17	23.73	26.91	33.28	39.65	46.01	52.36	61.91
50	QL-UPIAN-U□			→	1.19	3.85	6.50	8.22	11.79	14.60	17.38	22.94	26.12	32.49	38.86	45.22	51.57	61.12
100	QL-UPIAJ-U□				→	2.65	5.31	7.03	10.60	13.40	16.18	21.75	24.92	31.29	37.66	44.02	50.38	59.92
200	QL-UPIAH-U□					→	4.37	7.94	10.75	13.52	19.09	22.26	28.63	35.00	41.36	47.72	57.26	57.26
300	QL-UPIAB-U□						→	1.72	5.29	8.09	10.87	16.44	19.61	25.98	32.35	38.71	45.07	54.61
400	QL-UPIAG-U□							→	2.86	6.37	9.15	14.72	17.89	24.26	30.63	36.99	43.35	52.89
600	QL-UPIAE-U□								→	4.26	7.04	12.61	15.78	22.15	28.52	34.88	41.24	50.78
900	QL-UPIA4-U□									→	4.51	10.08	13.26	19.63	26.00	32.35	38.71	48.26
1200	QL-UPIAD-U□										→	7.58	10.76	17.13	23.50	29.85	36.21	45.75
1800	QL-UPIAU-U□											→	5.74	12.12	18.48	24.84	31.20	40.74
2400	QL-UPIAV-U□												→	9.26	15.64	22.00	28.35	37.90
3600	QL-UPIA6-U□													→	9.90	16.26	22.61	32.16
4800	QL-UPIA5-U□														→	10.52	16.88	26.42
6000	QL-UPIAT-U□															→	11.16	20.71
7200	QL-UPIA7-U□																→	14.98

Example:

You run ALL-IN-1 on a VAX 8500 (ClusterWide value of 400 points), and add a new VAXserver 6000-410 (400 points) to make a VAXcluster. What is the cost of upgrading the ClusterWide licence to reflect the new configuration?

Answer:

Your current ClusterWide points value is 400. You wish to upgrade to 800 points (from 400 points for the VAX 8500, plus 400 for the VAXserver 6000-410). Follow the 'From' (Existing Points) column downwards to the 400 points row. Now follow the 400 points row horizontally; as there is no column for 800 points, stop at the next column — for 900 points. The upgrade multiplier is 6.37. From the ALL-IN-1 page, the 10-point base rate is £3945. Hence the approximate cost of the upgrade is 6.37 x £3,945 = £25,130.

Now compare what the upgrade would have cost you with Traditional licences: the need will be for an extra Cluster Licence for ALL-IN-1 on the VAXserver 6000-410 (QL-AAAEG-AB), which costs £26,300.

So, by going ClusterWide, you've immediately saved around £1200 — and you've still got 100 points to cover future expansion at no extra cost! For example, you could use these 'spare' points as ALL-IN-1 licences for 10 additional clustered workstations at 10 points each, saving yourself £15,780 at current prices! The savings are even greater as you add to your VAX configuration.



Base systems

The Network is the System. The system comprises hardware and software from a variety of manufacturers, third parties and in house. Digital's absolute competitive strength — and those of our customers — is the degree to which computer resources across an enterprise can be integrated into one cohesive computing environment. Digital's operating systems are but part of this overall strategy. The following section demonstrates how Digital's core operating environments are built, enhanced and locally connected.

Our range of MAILbus, communications, information management and office products build on these core technologies. All give you unmatched business connections, both within, and outside, your enterprise... anywhere in the world.

ULTRIX

THE PROGRAMMER-FRIENDLY OPERATING SYSTEM

The ULTRIX™ Operating System is Digital's implementation of the portable UNIX operating environment for Digital processors and workstations. ULTRIX is derived from Berkeley Standard Distribution (BSD) 4.2, with selected 4.3 enhancements. It complies with AT&T's System V Interface Definition, Issue 2, Volume 1, and includes 200 of the most popular utilities and commands from both of these UNIX software systems. ULTRIX runs on Digital's family of VAX and RISC processors.

ULTRIX enhancements

ULTRIX V4.0 contains many significant UNIX enhancements:

- Symmetric Multi-Processing (SMP) to support up to six processors
- ULTRIX/SQL, a standard SQL database, now included.
- DECrpc, a remote procedure call mechanism based on NCS (Network Computing System) from HP/Apollo.
- X11 Release 3 with OSF/Motif option.
- A Security extension to meet the USA C2 security classification.
- The full Kerberos Authentication, Network Time and Hesiod Naming Services from MIT Project Athena.
- Adobe Display PostScript implemented in the ULTRIX kernel for improved performance.

Digital provides users with many built-in, automatic system-tuning features. These features include online system exercisers, error reporting and diagnostic support. The functionality of the ULTRIX kernel can be reconfigured without changing the source code of the kernel. ULTRIX also incorporates the Bad Block Replacement (BBR) feature, which protects the integrity of disk-held data.

ULTRIX supports Digital's CDA™ (Compound Document Architecture) for creating, storing and interchanging files. These files can be edited, formatted or otherwise processed as documents. ULTRIX support includes provision for mailing compound documents without loss of content or formatting information.

ULTRIX now has optional support for OSF/Motif; the licence is included with each workstation, you need only purchase a media kit. Please see the separate OSF/Motif article for further information.

ULTRIX Worksystem Software

ULTRIX Worksystem Software (UWS) delivers more firsts with the workstation industry's most robust implementation of the X version 11 Windowing System™ on the UNIX operating system today. This is one of the major reasons why more and more software producers are using DECstations to show their products running at their best — high performance quality!

Upgrades

Upgrades are now available (for both workstation and timesharing systems) between any specified user count, for example from 16 to 32 users.

Are you being served?

Several workstations, whether they are DECstations or VAXstations, can boot from any specified ULTRIX host computer. If you wish to do this, you will need to purchase one copy of the appropriate server licence and media kit for each type of workstation you are serving. If you need any configuration advice or guidance regarding such upgrades, please call us. We'll be delighted to help.

VMS and ULTRIX work together

Two optional products allow ULTRIX and VMS systems to operate in concert. The VMS/ULTRIX Connection product provides an NFS server and TCP/IP environment for VMS systems, allowing your users to take advantage of client facilities present on ULTRIX and many other implementations of UNIX. The VMS/ULTRIX Connection is described in the Base Systems section.

ULTRIX Mail Connection allows the bi-directional transfer of electronic mail between ULTRIX/UNIX systems and mail systems supported by the VAX MAILbus products. These extend the mail facilities

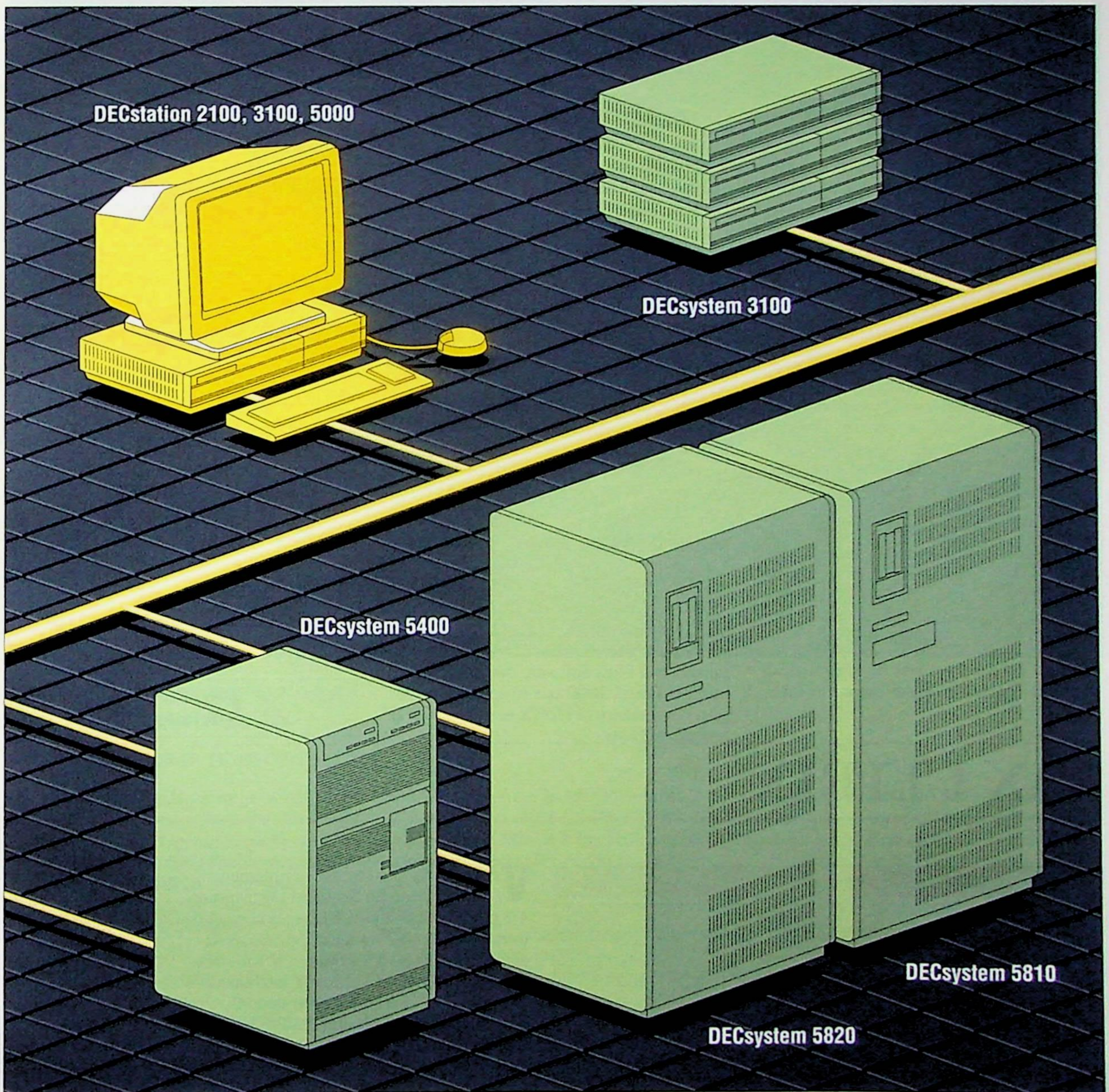
DECstation 2100, 3100, 5000 Options

For starters	Licence
ULTRIX/RISC Worksystem S/W - 2 Users V4.0	QL-VV1AC-BC QL-VV1AA-BC
Upgrades	
ULTRIX/RISC 2-4 User Upgrade	QL-VV1A8-BD
ULTRIX/RISC 5-8 User Upgrade	QL-VV1A8-B8
ULTRIX/RISC 9-16 User Upgrade	QL-VV1A8-B6
ULTRIX/RISC 17-32 User Upgrade	QL-VV1A8-BS
ULTRIX/RISC 33-64 User Upgrade	QL-VV1A8-BT
ULTRIX/RISC 65-Unlimited Upgrade	QL-VV1A8-B9
ULTRIX/RISC Server Licence	QL-YL5AA-AA
Media Kits	
ULTRIX Worksystem 2 User Media	QA-VV1AA-H5
ULTRIX Worksystem 2 User Media	QA-VV1AA-H8†
OSF/Motif Media	QA-YMCAA-H5

DECsystem (ULTRIX/RISC Timesharing) Options

To start	DECsystem: Licence	3100 5100 N	5000 5400 5500 S	5810 2	5820 3	5830 4	5840 D
ULTRIX/RISC 2 Users	QL-VYVA❑-BC						
Upgrades							
ULTRIX/RISC 2-4 User Upgrade	QL-VYVA8-BD						
ULTRIX/RISC 5-8 User Upgrade	QL-VYVA8-B8						
ULTRIX/RISC 9-16 User Upgrade	QL-VYVA8-B6						
ULTRIX/RISC 17-32 User Upgrade	QL-VYVA8-BS						
ULTRIX/RISC 33-64 User Upgrade	QL-VYVA8-BT						
ULTRIX/RISC 65-Unlimited Upgrade	QL-VYVA8-B9						
ULTRIX/RISC Server Licence	QL-YL5A❑-AA						
DECnet-ULTRIX	QL-716A❑-AA						
ULTRIX/RISC 2-User Media Kits							
ULTRIX/RISC 2 Users Media for DECsystem	QA-VYVAA-H5 (TK50)						
ULTRIX/RISC 2 Users Media for DECsystem	QA-VYVAA-H8† (CD-ROM)						
DECnet-ULTRIX Media	QA-716AB-H5						

†CD-ROM Media Kit includes ULTRIX and DECnet for DECsystem 3100, DECstation 2100/3100 only.



he ULTRIX™ Operating System is Digital's implementation of the portable UNIX operating environment for Digital processors and workstations. ULTRIX is derived from Berkeley Standard Distribution (BSD) 4.2, with selected 4.3 enhancements. It complies with AT&T's System V Interface Definition, Issue 2, Volume 1, and includes 200 of the most popular utilities and commands from both of these UNIX software systems. ULTRIX runs on Digital's family of VAX and RISC processors.

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- A Security extension to meet the USA C2 security classification.
- The full Kerberos Authentication, Network Time and Hesiod Naming Services from MIT Project Athena.
- Adobe Display PostScript implemented in the ULTRIX kernel for improved performance.

Digital provides users with many built-in,

UNIX Networking Options

Digital offers a wide variety of networking products for the UNIX user including synchronous and asynchronous DECnet, as well as X25 Access. In addition TCP/IP can be run on top of either X25 or synchronous DECnet, allowing it to travel over wide area networks.

DECnet-ULTRIX

DECnet-ULTRIX is an optional software product that permits connections to existing VMS, RSX, MS-DOS, TOPS-20 and other DECnet systems. DECnet-ULTRIX provides Wide Area Network terminal emulation, file transfer, mail facilities and task-to-task communications as outlined by the Digital Network Architecture.

One of the most important functions of DECnet-ULTRIX is the ability to extend the facilities of a DECnet network to users of non-Digital operating systems. The Internet Gateway, an inherent component of DECnet-ULTRIX, allows bidirectional communications between DECnet and TCP/IP-based Internet networks. DECnet users and TCP/IP users can also share files, exchange mail and remotely login to each others' systems via this gateway. DECnet-ULTRIX is integral to the DECnet Phase V Program, and provides ULTRIX users with a firm, clear migration path to OSI.

The DECnet licence is now bundled with all Workstations; just purchase the media kit.

DECrouters

DECrouters allow any DECnet end node (VMS, ULTRIX or MS-DOS) to link onto Ethernet via an asynchronous connection (DECrouter 200) or synchronous connection (DECrouter 2000) or a combination of both (DECrouter 250).

X25routers

X25routers provide a connection to an X.25 network that can be shared by several systems on the same Ethernet. They are a dedicated piece of hardware: for example the X25router 2000.

DEC X.25 Access for ULTRIX V1.0

DEC X.25 Access for ULTRIX V1.0 provides X.25 connectivity for ULTRIX systems using an X.25 router or any VAX VMS system running PSI Multihost. These ULTRIX systems will interoperate with systems from other vendors having implemented TCP/IP over X.25. Moreover, non-Digital TCP/IP-based systems on the LAN can use the X.25 connectivity offered by an ULTRIX X.25 Access system.

Internet Portal for ULTRIX.

The Internet Portal allows you to use an existing DECnet wide area backbone to carry TCP/IP protocol traffic. This extends the capabilities of TCP/IP whilst protecting your existing investment. The Internet Portal Load Host Software downloads to an Internet Portal 2000 box to achieve this for your community of UNIX or other TCP/IP compliant hosts.

DECrouter-200 ULTRIX		SPD 27.72
LICENCE	QL-VCBA9-AA	(Included)
MEDIA	QA-VDKAA-H5	(TK50)
or	QA-VDKAA-HM	(Tape)

DECrouter-250 ULTRIX		SPD 32.15
MEDIA	QA-YG6AB-H5	(TK50)
or	QA-YG6AB-HM	(Tape)

DECrouter-2000 ULTRIX		SPD 28.85
MEDIA	QA-VI9AA-H5	(TK50)
or	QA-VI9AA-HM	(Tape)

X25router-2000/ULTRIX V1.1		SPD 28.86
MEDIA	QA-VIAAB-H5	(TK50)
or	QA-VIAAB-HM	(Tape)

Internet Portal for ULTRIX V1.0		SPD 31.61
MEDIA	QA-VZTAA-H5	(TK50)
or	QA-VZTAA-HM	(Tape)

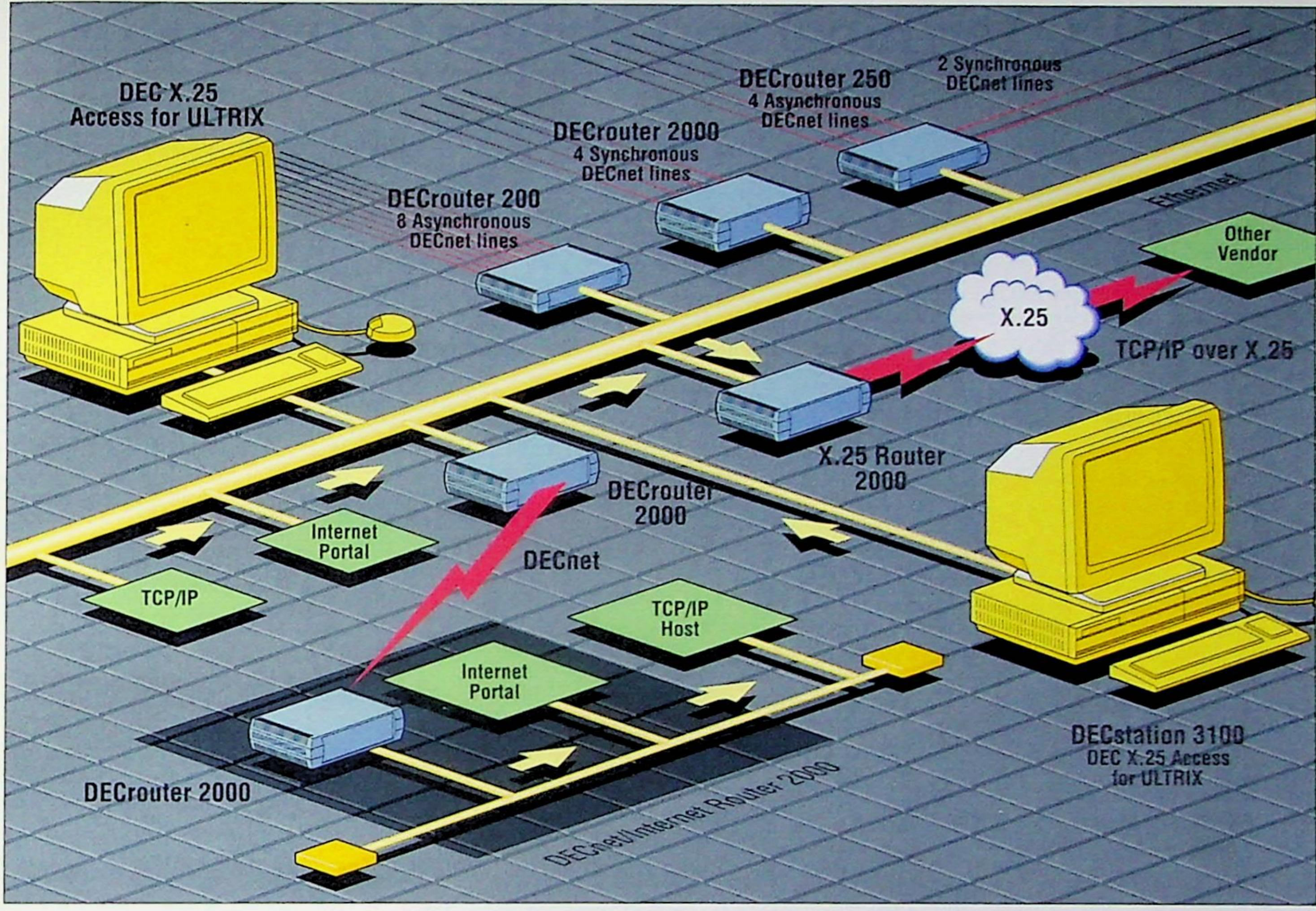
VAX ULTRIX

VAX/ULTRIX & DECnet-ULTRIX

Applicable CPUs	Part Number	
MV3100, VAX 6000-410, VAX 6000-420 MV3300/MV3400	QA-VEYAB-H5	(TK50) (TK50)
All VAXServers MV2000, MVII, MV/3500/3600, MV3800/3900VAX 6210,VAX 6000-210,VAX 6220, VAX 8820, VAX 6310, VAX 6000-310, VAX 6320	QA-VEYAB-H5	(TK50)
VAX 82xx, 83xx	QA-VEYAC-HM	(Tape)
VAX 86xx	QA-VEYAD-HM	(Tape)
VAX 78x	QA-VEYAE-HM	(Tape)
VAX 750	QA-VEYAF-HM	(Tape)
VAX 85xx, 8700, 8800, 8810	QA-VEYAH-HM	(Tape)
VAX 8820	QA-VEYAJ-HJ	(RA60)
DECnet-ULTRIX (all processors)	QA-716AA-H5 QA-716AA-HM	(TK50) (Tape)
MV2000	QA-VEYAB-H5	(TK50)

VAX ULTRIX is Digital's implementation of Berkeley Standard Distribution 4.2 UNIX (with selected 4.3 enhancements) to run on our VAX range of processors. It complies with AT&T's System V Interface Definition, Issue 2, Volume 1, and includes 200 of the most popular utilities and commands from both of these UNIX software systems.

The timesharing options are outlined here: additional VAX workstation part numbers can be found in the rear of the catalogue.



SCO/UNIX

OPENING UP YOUR OPTIONS ON UNIX

Digital has extended its range of UNIX based solutions to include the market-leading Santa Cruz Operation range of products. These products enable you to run industry-standard UNIX on any Intel 80386 or 80486 Personal Computer including Digital's DECstation 300, 325 and 425 machines.

There are two main products giving you either a single-user workstation or alternatively a multi-user system. The products are summarised below.

Single-user system: Open Desktop

Open Desktop turns a DECstation 300, 350 or 425 into a fully-fledged UNIX graphical workstation. It combines a graphical user interface and full 32-bit, multi-tasking computing power with transparent networking, distributed database management, and complete DOS-UNIX System integration.

Multi-user system: SCO UNIX System V/386 V 3.2

The Santa Cruz Operation, Inc's. SCO UNIX System V/386 is the industry-standard multi-user, multi-tasking operating system for microcomputers.

SCO UNIX System V/386 is a robust implementation of AT&T UNIX System V for Intel-based PCs. It is the building block to which the following products can be added.

SCO VP/ix

With SCO VP/ix, the tremendous selection of off-the-shelf MS-DOS applications software for the PC can now be used with SCO UNIX System V/386. Under SCO VP/ix, multiple MS-DOS applications can run concurrently with conventional UNIX system processes in a fully paged, virtual memory environment.

SCO Networking/Communications Products

- SCO TCP/IP, Version 1.0 provides high-performance Ethernet network connections to a wide variety of operating systems and computers.
- SCO NFS, Version 1.1 provides file sharing connections across a TCP/IP LAN, allowing users on one machine to transparently and directly access files residing on a remote machine. SCO NFS features both 'client' and 'server' functionality. It requires SCO TCP/IP to run.
- SCO Portfolio: With SCO Portfolio Version 1.0 users can run several applications at the same time and 'hot key' between them. SCO Portfolio also offers workgroup tools including electronic mail, calculator, copy-paste clipboard and calendar.

The table of part numbers and prices can be found in the rear of the catalogue.

Please note that neither 286-based machines nor the DEPCA Ethernet controller are currently supported. If you require further information on any of the above products please call.

ULTRIX Terminal and Printer Connections

DECservers

The preferred way of connecting terminals to any Digital ULTRIX or VMS host is by use of a DECserver terminal server. Sitting on the Ethernet and loaded from any ULTRIX or VMS load host, these devices allow users to connect to any machine on the local area network. Host machines also benefit from a reduction in interrupt traffic, through use of the Local Area Terminal (LAT) protocol; this is a licensable technology if you wish to build your own LAT-compliant devices.

In addition to terminals, Digital printers with a serial line interface can also be connected to a terminal server. This is achieved using 'reverse LAT', allowing multiple hosts to connect to a terminal server-based print service. Digital terminal servers now have licences included in the hardware package, so only a media kit is required to get them running. The parts you may need are shown in the adjacent price panels.

MUXservers

MUXservers offer the same range of services as Digital's terminal servers, but permit the connection of remote terminals, via a multiplexor.

New! DECserver 250 for Printers

The DECserver 250 is Digital's first network server to provide connections for both serial and parallel printers. Positioned anywhere on an extended Ethernet LAN, the printers can connect to:

- Two parallel interfaces, compatible with Dataproducts parallel interface standard, at speeds of up to 2,000 lines per minute.
- Four asynchronous RS232 channels, two at up to 19.2Kb, the other two at 9.6Kb. A single port possesses modem control and, if desired, can handle a terminal on this line only.

Like other DECservers, the licences are included with the hardware.

VT1200

The new VT1200 X-windows terminal is supported by ULTRIX. The fonts needed by the terminal are loaded from any workstation or alternatively by installing the Server software onto any timesharing machine. (See the ULTRIX article for part numbers and prices.)

The VT1200 can use TCP/IP as the transport protocol between the server and client. It is therefore possible to use it with any workstation that supports X-windows.

DECserver-200 ULTRIX Load Host		SPD: 25.53
MEDIA	QA-VDEAA-H5	(TK50)
or	QA-VDEAA-HM	(Tape)

DECserver 250 ULTRIX Load Host V1.0		SPD: 25.J5
MEDIA	QA-VTNAA-H5	(TK50)
or	QA-VTNAA-HM	(Tape)

DECserver-300 ULTRIX Load Host		SPD: 25.J1
MEDIA	QA-VTVAA-H5	(TK50)
or	QA-VTVAA-HM	(Tape)

DECserver-550 ULTRIX Load Host		SPD: 26.97
MEDIA	QA-03KAA-H5	(TK50)
or	QA-03KAA-HM	(Tape)

MUXSERVER 300 V1.1		SPD: 25.F1
LICENCE	QL-VZHA9-AA	
MEDIA	QA-VZHAA-H5	(TK50)
or	QA-VZHAA-HM	(Tape)

PrintServers

There are two ways in which you can take advantage of Digital's Ethernet connected PostScript-based PrintServers. You may share an existing PrintServer with VMS machines using DECnet client software (in this environment, other UNIX machines can send their print jobs to the PrintServer via a DECnet-ULTRIX machine). Alternatively, you can dedicate a PrintServer to communicate using TCP/IP, and access it directly from a variety of UNIX based systems only.

Both the DECnet and TCP/IP PrintServer Client for ULTRIX have now been included with ULTRIX V4.0.

The intelligence resident in a PrintServer is loaded at power-up from an appropriate host with the 'Load Host' software resident. A licence for this software is included with the appropriate PrintServer hardware. In DECnet environments, the software is loaded from a VMS system (see *VMS V5.4 on other VAX Systems*). For TCP/IP PrintServers, this software is loaded from a specific ULTRIX machine.

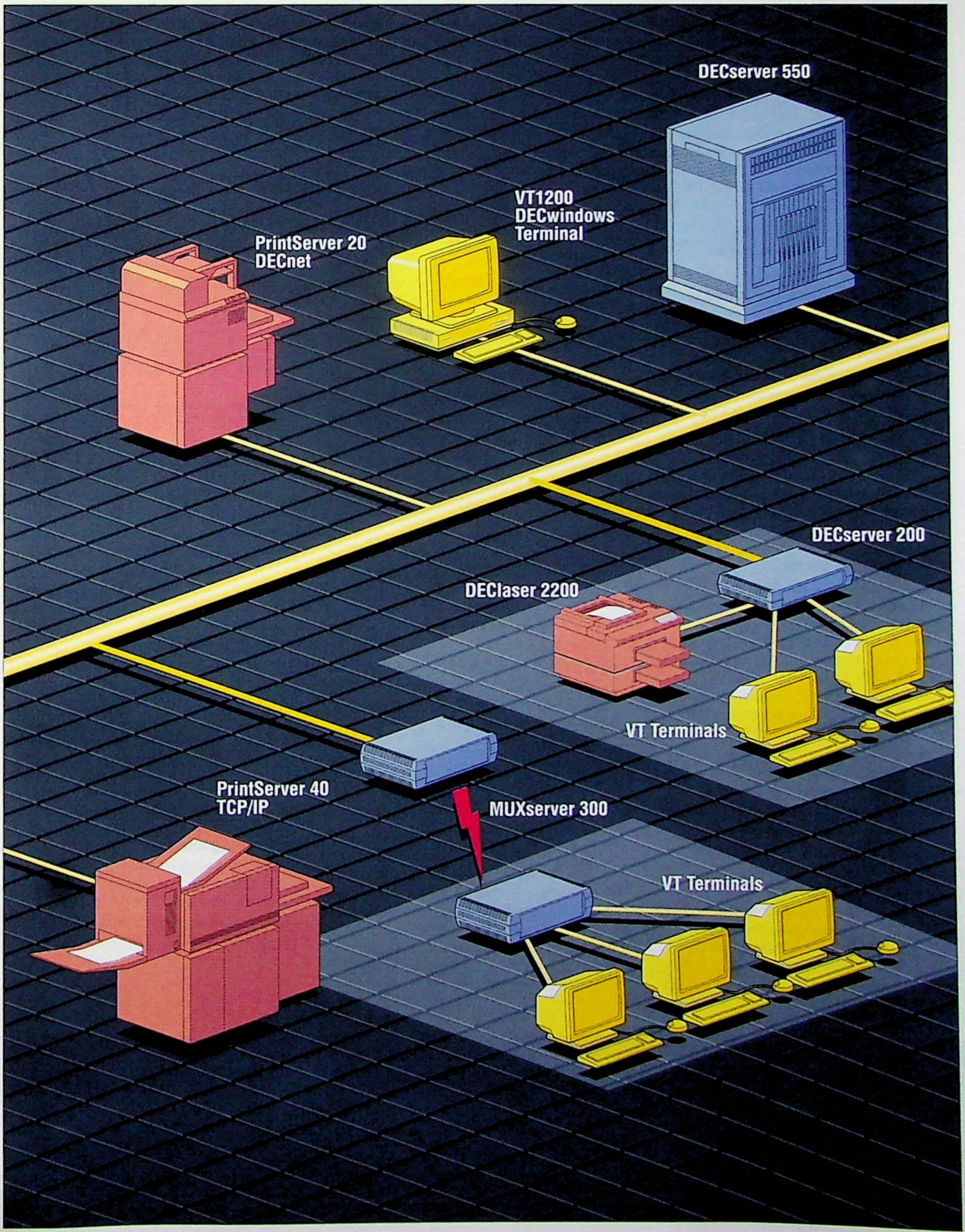
A source kit is available (via a local Digital office only) if you wish to have printing capabilities for a non-Digital Berkeley host — with no other Digital host present (QB-VVMA9-YM is the part number).

Similarly, users wishing to migrate an existing DECnet based PrintServer to a TCP/IP environment will need to purchase both the Load Host and Client Licences in addition to the appropriate media kits. The part numbers are QL-VVZA9-AA and QL-VVMA9-AA respectively.

ULTRIX Printserver Client V2.0		SPD: 30.86
MEDIA	QA-VVMAA-H5	(TK50)
or	QA-VVMAA-HM	(Tape)

Required for V3.X Systems only

ULTRIX TCP/IP Supporting Host V2.0		SPD: 30.85
MEDIA	QA-VVZAA-H5	(TK50)
or	QA-VVZAA-HM	(Tape)


DECserver 550
VT1200
DECwindows
Terminal
PrintServer 20
DECnet
DECserver 200
DEClaser 2200
VT Terminals
PrintServer 40
TCP/IP
MUXserver 300
VT Terminals

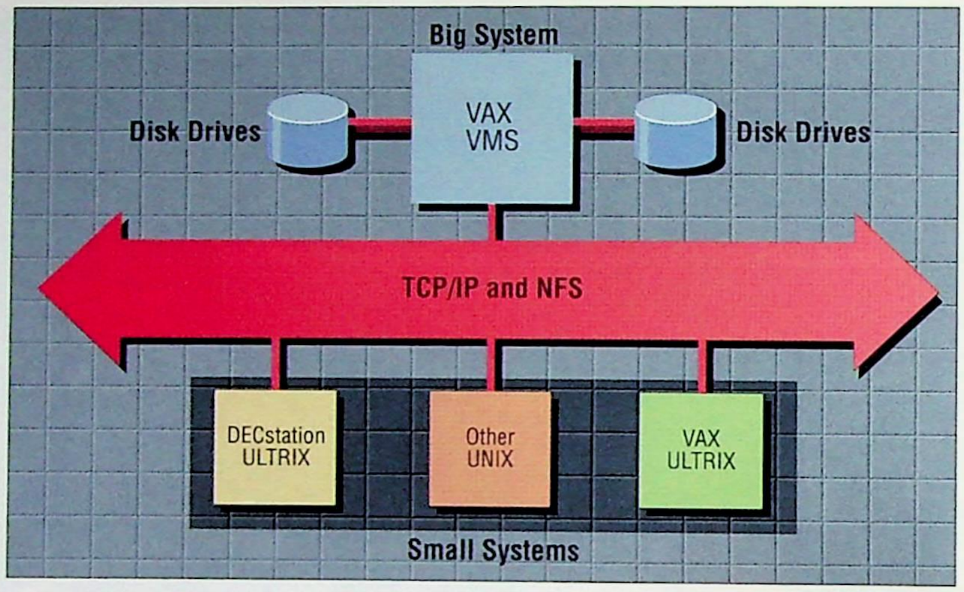
VMS/ULTRIX Connection

NEW VERSION 1.3

LINKING UNIX™ ENVIRONMENTS INTO VMS

Does your enterprise use both VMS and UNIX systems? Preserve your investment in both by building a bridge between them with the VMS/ULTRIX Connection.

- TCP/IP communications between VMS and UNIX offer users the best of both worlds.
- NFS server software provides workstation clients with access to VMS data files, and 100% UNIX file system compatibility.
- File Transfer Protocol offers bi-directional file access as an alternative to NFS.
- Telnet remote terminal protocol allows users to perform remote sessions between VMS and UNIX systems.
- Includes DECrpc support. DECrpc is Digital's implementation of the HP/Apollo NCS (Network Control System) Remote Procedure Call Interface.
- Programmer Interface allows you to begin developing custom applications today using standard TCP/IP protocols.



VMS/ULTRIX Connection provides NFS and TCP/IP capabilities for a VMS host or VAXcluster.

The best of both worlds

Now there's a way to get the best of VMS and UNIX… and expand the power and versatility of each. Users with a firm commitment to TCP/IP networking can take advantage of the powerful features that the VMS/ULTRIX Connection offers. Incorporating both File Transfer protocol (FTP), Remote Terminal Support (Telnet) and Network File System (NFS), the system offers the flexible sharing of data according to two separate methodologies. A programmer interface allows users to develop applications making their operating system investment even more valuable.

Features that grow with your needs

The VMS/ULTRIX Connection offers communications services like TCP/IP between the usually separate worlds of VMS and UNIX, by creating a server environment on VMS. Now you can extend the enhanced reliability and availability features of VAXcluster systems to NFS workstation clients. The NFS server software can be active on multiple nodes in a VAXcluster, offering high data availability and 100% UNIX file system compatibility (including full semantic compatibility) to workstation clients. Volume shadowing will further increase data availability on CI-based VAXcluster systems.

Functionality Overview

There are four elements to VMS/ULTRIX Connection:

- FTP, a file transfer protocol;
- Telnet, a remote terminal protocol;
- NFS, the Network File System Server;
- The Programming Interface.

FTP and NFS provide two different ways to access data on the VMS system, thus offering enhanced flexibility to users. Telnet allows users to conduct login sessions over the network. The Programmer Interface allows customers to start developing custom applications — immediately.

FTP

The File Transfer Protocol physically transfers data bidirectionally between the VMS and UNIX environments. While many users prefer the NFS methodology, FTP is useful in environments that do not have NFS capabilities. The key is providing access flexibility — a prime design goal of the VMS/ULTRIX Connection.

Telnet

The Telnet Remote Terminal Protocol allows users to establish a remote login session from a UNIX system to VMS, or vice versa. This also allows network users connected via TCP/IP terminal servers to directly access the VMS system.

NFS

Network File System technology allows multiple workstation users to directly access data that resides on VMS. This 'transparent remote data sharing' is the NFS model that many users prefer. Digital's NFS component offers superior performance, as well as more flexible security features, than most third-party NFS products.

Programming Interface

The Programming Interface brings the power to develop your own applications back to you, the user. The options of VMS-style QIO programming, or UNIX-style sockets programming are both offered.

VMS/ULTRIX Connection V1.3 SPD 25.A4

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	Q	N	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 4,100 blocks (2050 Kb). **Operation:** 3,800 blocks (1900 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-VHRA9-J**	MEDIA	**QA-VHRAA-H**
DOCS	**QA-VHRAA-GZ**		

VMS V5.4

OPERATING SYSTEM

VMS is Digital's internally developed, robust operating system. It is supported on the entire VAX computer range — from the smallest workstation to the largest data centre. Binaries on the smallest CPU will run without any conversion or rebuild on the largest, and vice versa. In these times of continuous change, VMS gives you the flexibility to deploy and redeploy your applications on any size of machine to suit your on-going business needs (predicted and otherwise!).

VMS Version 5.4 has now been released and includes several important new features which include:-

- VMS Volume Shadowing Phase II

VMS Volume Shadowing Phase II extends volume shadowing capabilities to all DSA disks having the same physical geometry. It includes support for local adapters, all DSSI (RF series) disk devices on any VAX computer, and across MSCP servers. Phase 11 supports shadowing on a single system or a VAXcluster system where inter-processor communication is carried out over a computer interconnect (CI), network interconnect (NI), Digital Small System Interconnect (DSSI), mixed-interconnect configuration, or the Ethernet. Further details of this are available in the article *Data Integrity and File System Performance.*

- Support for VAX 9000 and VAXft 3000 Computers.
- DECdtm Services

DECdtm services provide the base operating system support for distributed transactions. The DECdtm services comprise user system services, communication services and logging services. These services support a protocol that guarantees consistent execution of distributed transaction processing applications on the VMS operating system.

Desktop-VMS V1.1

Desktop-VMS Software is an easy-to-use VMS operating system environment, offering simplified system installation and system management. It has now been enhanced in its second version (V1.1).

It is delivered as a pre-integrated, pre-installed VMS system on compact disk and includes the VMS Operating System (V5.3), DECnet End Node software (V5.3), VAXcluster Software (V5.3) and Desktop-VMS 'ease-of-use' software, as system components.

Included on the CD-ROM are media kits as well as documentation for DECdecision, VAX Notes, VAX ScriptPrinter software and VAX Distributed File Services. All you need is the licence key to enable them.

You can now install Desktop-VMS onto a local hard disk, freeing up your CD-ROM drive for other uses.

OSF/Motif

OSF/Motif is the Open Software Foundation's (OSF™) specification for an open graphical user interface and its associated Application Programming Interface (API).

Motif™ enables users of workstations, mainframes, and PCs to take advantage of a consistent screen appearance and behaviour for applications running on any system which can support the X Window System™ Version 11, Release 3.

Today, Digital can provide OSF/Motif for the VMS and ULTRIX/UNIX environments. In addition, Digital will provide Motif display (server) capabilities for MS-DOS users.

Components of Digital's DECwindows user interface, called XUI, were selected by the OSF as the foundation and core of the OSF/Motif Application Programming Interface (API). The compatibility of DECwindows and OSF/Motif technology enables Digital to integrate Motif into its DECwindows Desktop Environment as a separate layered product.

OSF/Motif does not replace DECwindows. Motif will become the graphical user interface component of the DECwindows environment instead of XUI, DECwindows' current X user interface. Therefore, OSF/Motif within the DECwindows environment provides a simple way to standardize application presentation and interaction across all Digital platforms. OSF/Motif also preserves your current investments in software and training while delivering the greatest portability, interoperability, and scalability of applications available.

OSF/Motif for VMS V 1.0																SPD 332.37					
TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

TK50 5 Tape M		
MEDIA	LICENCE QL-YMAA [ ] -AA	MEDIA QA-YMAAA-H [ ]
	DOCS QA-YMAAA-GZ	

VMS options for MicroVAX and VAXstation CPUs

VAXstation 2000

	Licence	Media Kit	
VMS with DECwindows	QL-001AR-BB	QA-09SAA-H5 or QA-001AA-H5	(Small Doc Set) (Large Doc Set)
VAX VWS	QL-A96AR-AA	QA-A96AA-H5	
DECnet–VAX End Node	QL-D04AR-AA	(Included in VMS)	
DECnet End to Routing Upgrade	QL-D09AR-AA	(Included in VMS)	
VAXcluster Software	QL-VBRAR-AA	(included in VMS)	

VAXstation 3100

	Licence	Media Kit	
VMS with DECwindows	QL-001AC-BB	QA-09SAB-H5	(Small Doc Set)
Desktop-VMS	QL-VV8AC-BB	QA-VV8AA-H8	
VAX VWS	QL-A96AC-AA	QA-A96AA-H5	
DECnet–VAX End Node	QL-D04AC-AA	(Included in VMS)	
DECnet End to Routing Upgrade	QL-D09AC-AA	(Included in VMS)	
VAXcluster Software	QL-VBRAC-AA	(included in VMS)	

VAXstation 3200, 3500, 3520, 3540

	Licence	Media Kit	
VMS with DECwindows for VAXstation 3200, 3500	QL-001AC-BB	QA-09SAA-H5 or: QA-001AA-H5	(Small Doc Set) (Large Doc Set)
VMS with DECwindows for VAXstation 3520, 3540	QL-001AC-BB	QA-09SAA-H5 or: QA-001AA-H5	(Small Doc Set) (Large Doc Set)
VAX VWS	QL-A96AC-AA	QA-A96AA-H5	
DECnet–VAX End Node	QL-D04AC-AA	(Included in VMS)	
DECnet End to Routing Upgrade	QL-D09AC-AA	(Included in VMS)	
VAXcluster Software	QL-VBRAC-AA	(included in VMS)	

MicroVAX-2000

	Licence
VMS 1-4 Users	QL-001AP-BD
VMS 1-8 Users	QL-001AP-BE
VMS 1-16 Users	QL-001AP-BF
VMS Unlimited Users	QL-001AP-BZ
Media with Small Doc set	QA-09SAA-H5
Media with Large Doc Set	QA-001AA-H5
DECnet End Node	QL-D04AP-AA
DECnet Full Function	QL-D05AP-AA
VAXcluster Software	QL-VBRAP-AA

Upgrading your MicroVAX-2000?

	Licence
From 4 to 8 Users	QL-001AP-B8
From 8 to 16 Users	QL-001AP-B6
From 16 to Unlimited Users	QL-001AP-B7
DECnet End to Full Upg	QL-D09AP-AA

† 3200 and 3500 only.

MicroVAX-3100

	Licence
VMS 1-5 Users	QL-001AP-BM
VMS 5-10 Users Upgrade	QL-001AP-BW
VMS 10-16 Users Upgrade	QL-001AP-BU
VMS 16-Unlimited Users Upgrade	QL-001AP-BV
Media with Small Doc set	QA-09SAA-H5
Media with Large Doc Set	QA-001AA-H5
DECnet End Node	QL-D04AP-AA
DECnet Full Function	QL-D05AP-AA
DECnet End to Full Upgrade	QL-D09AP-AA
VAXcluster Software	QL-VBRAP-AA

VAX 4000 User Upgrade

	Licence
From 40 to Unlimited Users	QL-001A2-B4
DECnet End to Full Upg	QL-D09A2-AA

MicroVAX-II

	Licence
VMS 1-2 Users	QL-001AN-BC
VMS 1-8 Users	QL-001AN-BE
VMS 1-16 Users	QL-001AN-BF
VMS Unlimited Users	QL-001AN-BZ
Media with Small Doc set	QA-09SAA-H5
Media with Large Doc Set	QA-001AA-H5
DECnet End Node	QL-D04AN-AA
DECnet Full Function	QL-D05AN-AA
VAXcluster Software	QL-VBRAN-AA

Upgrading your MicroVAX-II?

	Licence
From 2 to 8 Users	QL-001AN-B5
From 8 to 16 Users	QL-001AN-B6
From 16 to Unlimited Users	QL-001AN-B7
DECnet End to Full Upg	QL-D09AN-AA

MicroVAX 3300/3400

	Licence
VMS 1-5 Users	QL-001AS-BM
VMS 5-10 Users Upgrade	QL-001AS-BW
VMS 10-20 Users Upgrade	QL-001AS-B2
VMS 20-30 Users Upgrade	QL-001AS-BX
VMS 30-Unlimited Users Upgrade	QL-001AS-BY
Media with Small Doc set	QA-09SAA-H5
Media with Large Doc Set	QA-001AA-H5
DECnet End Node	QL-D04AS-AA
DECnet Full Function	QL-D05AS-AA
DECnet End to Full Upgrade	QL-D09AS-AA
VAXcluster Software	QL-VBRAS-AA

MicroVAX 3500/3600/3800/3900

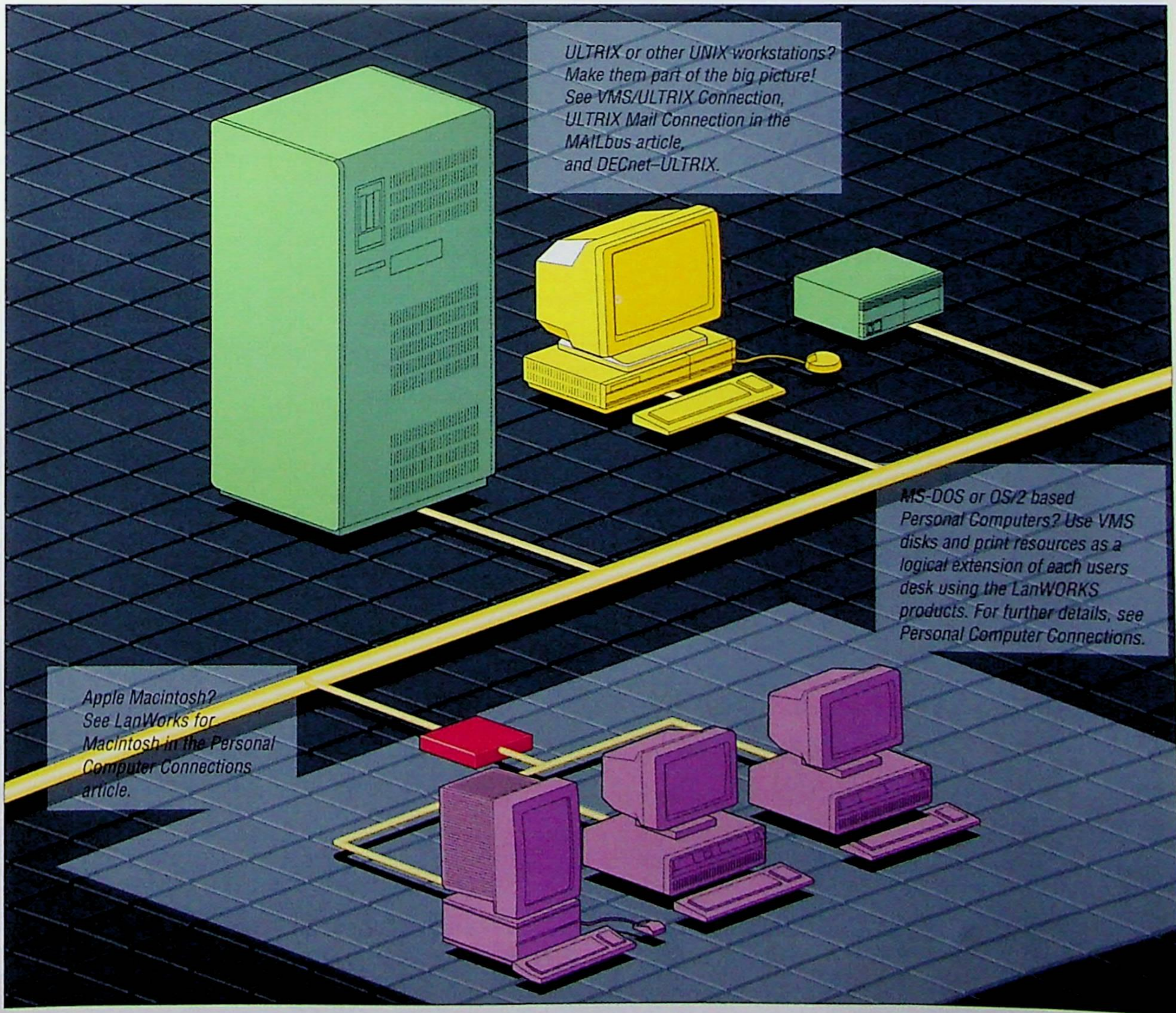
	Licence
VMS 1-10 Users	QL-001AB-BL
VMS 10-20 Users Upgrade	QL-001AB-B2
VMS 20-40 Users Upgrade	QL-001AB-B3
VMS 40-Unlimited Users Upgrade	QL-001AB-B4
Media with Small Doc set	QA-09SAA-H5
Media with Large Doc Set	QA-001AA-H5
DECnet End Node	QL-D04AB-AA
DECnet Full Function	QL-D05AB-AA
DECnet End to Full Upgrade	QL-D09AB-AA
VAXcluster Software	QL-VBRAB-AA

VMS V5.4 on other VAX Systems

VMS licences are included on all other VAX processors. VAXservers come with single user licences (as they are used as disk, print or compute servers only, with the occasional need for the system manager to log in). Other VAX systems come with unlimited user count licences; the tricky part is to order the correct VMS media kit for your machine!

Please find here the current list of media kits available, against the VAX computers that each applies to.

Applicable CPUs		Large Doc Set Part Number	Small Doc Set Part Number	Media
VAXstation 3100		n/a	QA-09SAB-H5	TK50
	or:	n/a	QA-09SAB-HM	Tape
	or:	n/a	QA-09SAB-H8	CD
Desktop-VMS on CD-ROM		n/a	QA-VV8AA-H8	CD
VS2000, VSII, VS3200, VS3500,		QA-001AA-H8	QA-09SAA-H8	CD
VAXsrv3xxx, MV2000, MVII, MV3xxx	or:	QA-001AA-H5	QA-09SAA-H5	TK50
VAX 6210,VAX 6000-210, VAX 6310, VAX 6000-310, VAXsrv 6310, VAXsrv 6320, all 6000-xxx, 6xxx	or:	QA-001AG-HM	QA-09SAA-HM	Tape
VS3520, 3540		n/a	QA-09SAA-H8	CD
		n/a	QA-09SAA-H5	TK50
VAX 725, VAX 730, VAX 750		QA-001AF-HM	QA-09SAF-HM	Tape
VAX 780, 785		QA-001AE-HM	QA-09SAE-HM	Tape
VAX 86xx		QA-001AD-HM	QA-09SAD-HM	Tape
VAX 82xx, 83xx, 85xx, 8700, 8800, 8810, 8820-N		QA-001AC-HM	QA-09SAC-HM	Tape
VAX 8820, 8830, 8840		QA-001AB-HM	n/a	Tape



Data Integrity and File System Performance

RMS Journalling

VAX RMS Journalling provides data integrity for any RMS sequential, relative or indexed file. Your applications need not be specially adapted to make use of this facility; the journalling takes place without the need to write data integrity code into your application.*

- Protects RMS data files from loss and inconsistency, potentially caused by a variety of external factors.
- Three different methods: after-image, before-image, and recovery unit journalling.
- Supports all RMS file organisations: sequential, indexed and relative.
- Activated using simple DCL commands.

VAX RMS Journalling is a powerful software tool to ensure data consistency and integrity of data records based on the VMS RMS subsystem (Record Management Services). It gives the user the ability to include changes made in a file, or to make them retrospectively. Time-intensive recovery work is not necessary since the error-free state of a file can be re-established using the journal.

Supports all RMS file organisations

RMS Journalling can be used on single or multiple files. A file can be marked for one of the journalling types or for a combination. The three journalling methods can also be combined as desired within an application.

Prices for RMS Journalling can be found in the Priced Index by Operating System. Documentation is not included in the VMS documentation set. This must be ordered separately – part number QA-VDVAA-GZ.

* *Code already present in VMS.*

Disk Striping Driver

Some users have applications which need to read or write a file at a higher rate (Mb/sec) than a single RA or RF series disk drive can provide. By spreading the file across several disk drives, and reading or writing over several channels (controllers) simultaneously, much higher bandwidth can be achieved. Disk Striping is a technique which allows multiple I/O requests to be executed in parallel by several disk drives (and controllers) in response to what the application views as a single I/O request.

The VAX Disk Striping Driver implements such Disk Striping for VMS systems. The VAX Disk Striping Driver provides the ability to create one or more 'stripesets', each composed of two or more physical disk drives and represented to user applications (and VMS utilities) as a single pseudo-device. As a consequence, the VAX Disk Striping Driver is transparent to almost all VMS software; only diagnostic software, which needs to diagnose members individually, is the exception.

The User may select the 'chunk' size (which defaults to the number of logical blocks on the disk track) and number of stripe members for ultimate application performance.

Which method for which error situation?

	Journalling		
Causes of error	**After Image**	**Before Image**	**Recovery Unit**
Head crash	✓		
Intentional			
- deletion	✓		
- overcopying	✓		
Updates with			
- incomplete files	✓		
- destroyed files	✓		
System error	✓	✓	
Application error	✓	✓	
Incorrect inputs	✓	✓	
Data consistency after error (e.g. power failure)			✓

RMS Journalling V5.4 SPD 27.58

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System.Required Documentation RMS Journalling QA-VDVAA-GZ.

TK50 **5** Tape **M**		
MEDIA	LICENCE	**QL-VDVA** ☐ **-AA** MEDIA Included in VMS ☐
	DOCS	**QA-VDVAA-GZ**

VMS Volume Shadowing SPD 27.29

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System V5.4. **Required Hardware:** Any Vax with MSCP-compliant DSA disks.

TK50 **5** Tape **M**		
MEDIA	LICENCE	**QL-AB2A** ☐ **-AA** MEDIA Included in VMS ☐
	DOCS	**QA-AB2AA-GZ**

VAX Disk Striping Driver V1.0 SPD 31.66

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 2,500 blocks (1.3Mb) **Operation:** 1,500 blocks (0.8Mb).

TK50 **5** Tape **M**		
MEDIA	LICENCE	**QL-YELA9-J** ☐ MEDIA **QA-YELAA-H** ☐
	DOCS	**QA-YELAA-GZ**

VMS Volume Shadowing Phase II

Volume shadowing is the process of maintaining multiple copies of the same data on two or more disk volumes. This duplication of data provides greater data availability and faster data access. The system can also find data more quickly because it can search more than one disk. If media deteriorates or fails on one device, systems with volume shadowing can duplicate data and copy it to the failing volume.

Before VMS 5.4, VMS only supported only Phase I volume shadowing. This provides centralised shadowing using HSC controllers with compatible DSA disks. Phase I shadowing is limited to CI configurations on a single system or VAXcluster.

VMS Volume Shadowing Phase II supports:

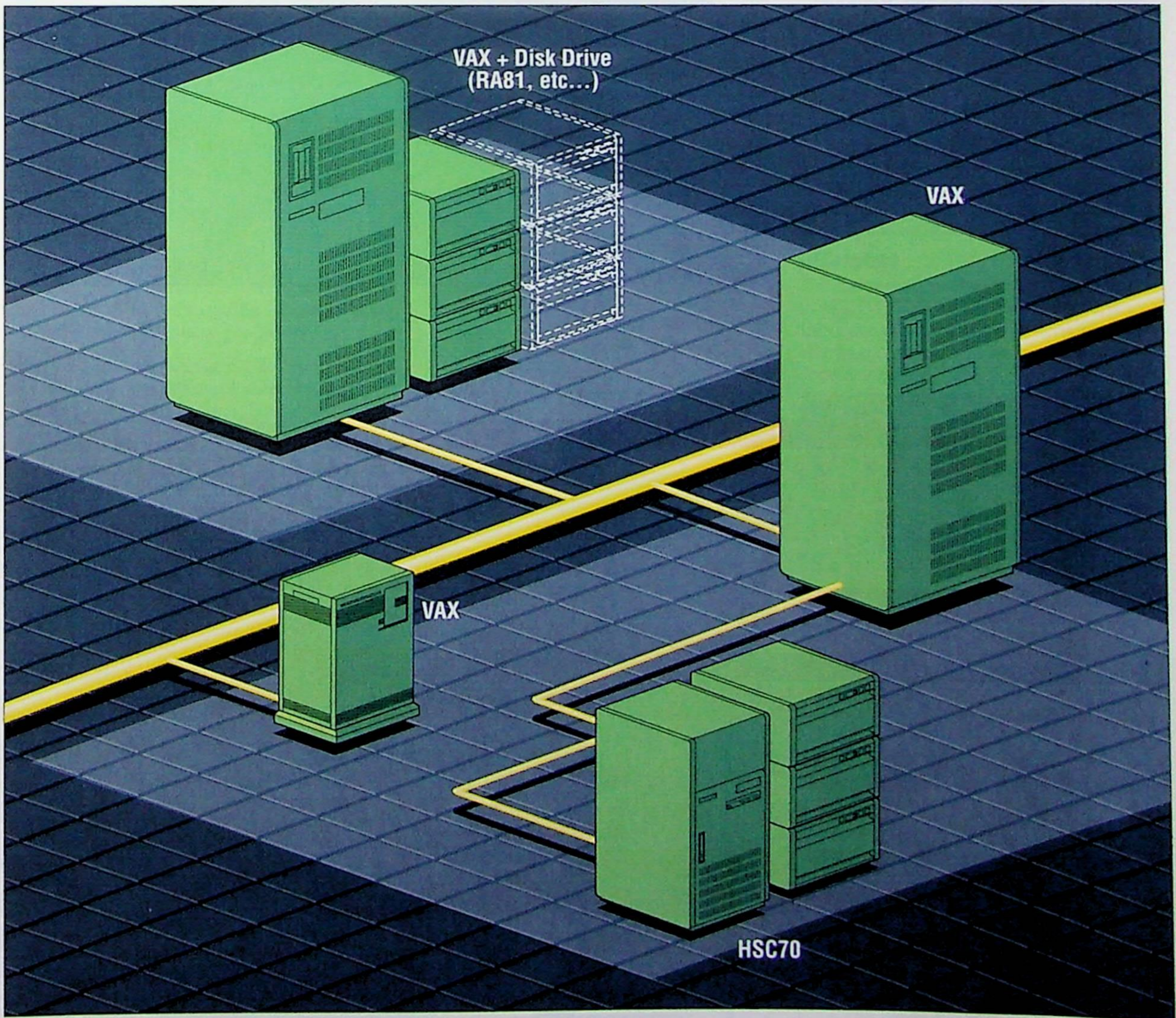
- Cluster-wide shadowing of all MSCP-compliant DSA disks having the same physical geometry on a single system or located anywhere in a VAXcluster system.

Volume Shadowing Phase II supports clusterwide shadowing of all DSA devices. Phase II is not limited to HSC-controlled disks, but supports all DSA disks including local adapters, all DSSI (RF series) disk devices on any VAX computer, and across MSCP servers.

- Distributed, not centralised, shadowing.

Volume Shadowing Phase II creates and maintains virtual units in a distributed fashion on each node in the cluster. Phase II supports shadowing on a VAXcluster where interprocessor communication is carried out over computer interconnect (CI), network interconnect (NI), Digital small systems interconnect (DSSI) or mixed interconnect.

It is possible to use both Phase I and Phase II shadowing on the same node at the same time. You can also mix Phase I and Phase II shadowing in a VAXcluster system.



DECnet Options

NEW VERSION 5.4

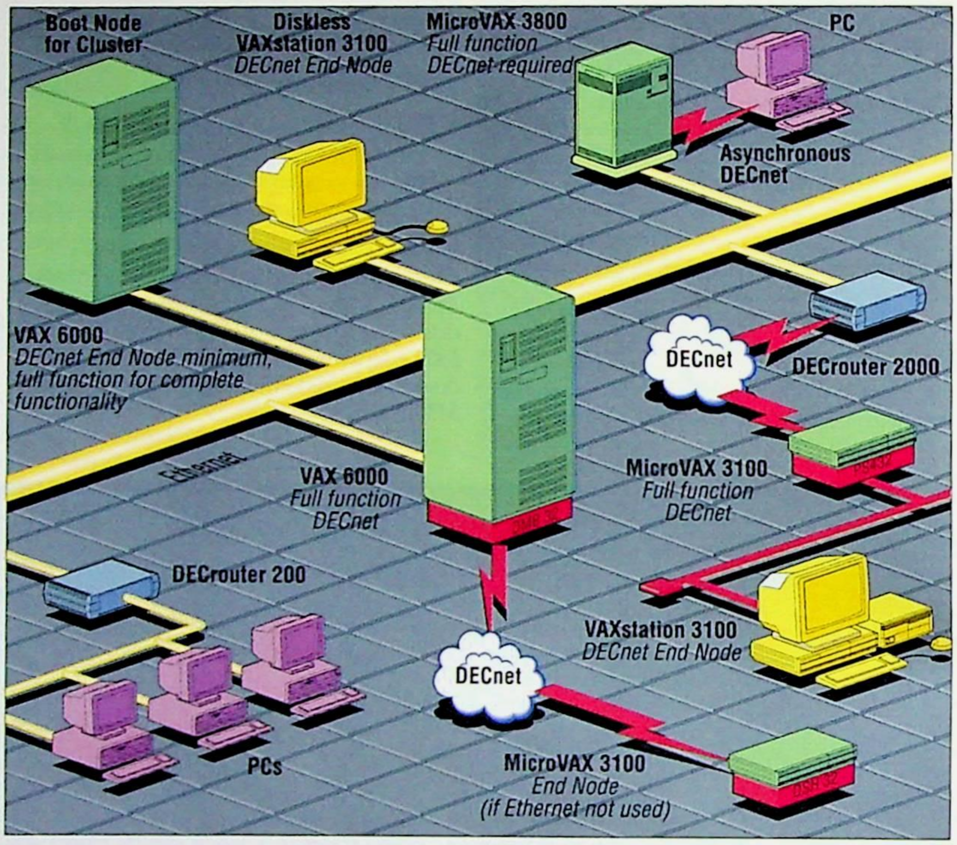
THE DIGITAL STANDARD

DECnet is Digital's standard networking product, covering all Digital platforms and selected Personal Computers. The user does not need to be aware of the physical location of any machine; the same commands are used for both local and wide-area networks.

DECnet re-routes traffic dynamically to suit network conditions, and does not need the specification (or maintenance) of traffic paths. This allows new capital equipment investments to be added to the network with a minimum of effort, anywhere in the world.

DECnet comes in one of two varieties. Routing (also known as full function) implementations provide traffic routing and postmaster tasks on behalf of a local area network user community; Non-Routing (also known as 'end node') versions provide for one physical network connection (such as to an Ethernet) only, and use far less local disk resources.

Which one do you need? The guideline is that if you have two physical network connections on your processor (such as one to an Ethernet, and one on a synchronous line to another DECnet machine), you need the routing version.



DECnet End Node V5.4 SPD 25.03

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS V5.4.

TK50 **5** Tape **M**
MEDIA

LICENCE	**QL-D04A** ☐ **-AA**	MEDIA Included in VMS ☐
DOCS	**QA-D04AA-GZ**	

DECnet Full Function V5.4 SPD 25.03

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS V5.4.

TK50 **5** Tape **M**
MEDIA

LICENCE	**QL-D05A** ☐ **-AA**	MEDIA Included in VMS ☐
DOCS	**QA-D05AA-GZ**	

DECnet End to Full Upgrade V5.4 SPD 25.03

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS V5.4 DECnet End Node.

TK50 **5** Tape **M**
MEDIA

LICENCE	**QL-D09A** ☐ **-AA**	MEDIA Included in VMS ☐
DOCS	**QA-D09AA-GZ**	

Wide Area Network Connections

NEW VERSION 1.1A

DIGITAL HAS THE CONNECTIONS

VAX WAN Device Drivers Kit

WAN Device Drivers and DECnet

Connection from one machine to another at a different geographic location is, for the most part, achieved using a Digital synchronous adapter fitted to your VMS system. Unlike previous releases of VMS, all the device drivers for such synchronous options are provided on a separately licensed option — the VAX Wide Area Network Device Drivers Kit.

Further information about this kit and its content is available on SPD 29.64 or by ringing DECdirect. The parts needed for purchase are:

VAX WAN Device Drivers Kit V1.1A — SPD 29.64

LICENCE	**QL-VAWA9-AA**	(all processors)
MEDIA	**QA-VAWAA-H5**	(TK50)
or	**QA-VAWAA-HM**	(Tape)

X.25 Connections

Connections to an X.25 network have traditionally been achieved using VAX P.S.I. in conjunction with an appropriate synchronous hardware option. Only one connection to the Packet Switched Network is needed; extra machines can make use of this link using VAX P.S.I. Access from anywhere on the same DECnet network. This applies for both local and remote processors.

Alternatively, you can use an X25router box, which connects to an Ethernet local area network cable. The intelligence for this is loaded from a VAX host on power-up, hence the need for a separate media kit to be loaded on one or more hosts:

X25router Software V1.1 — SPD 28.86

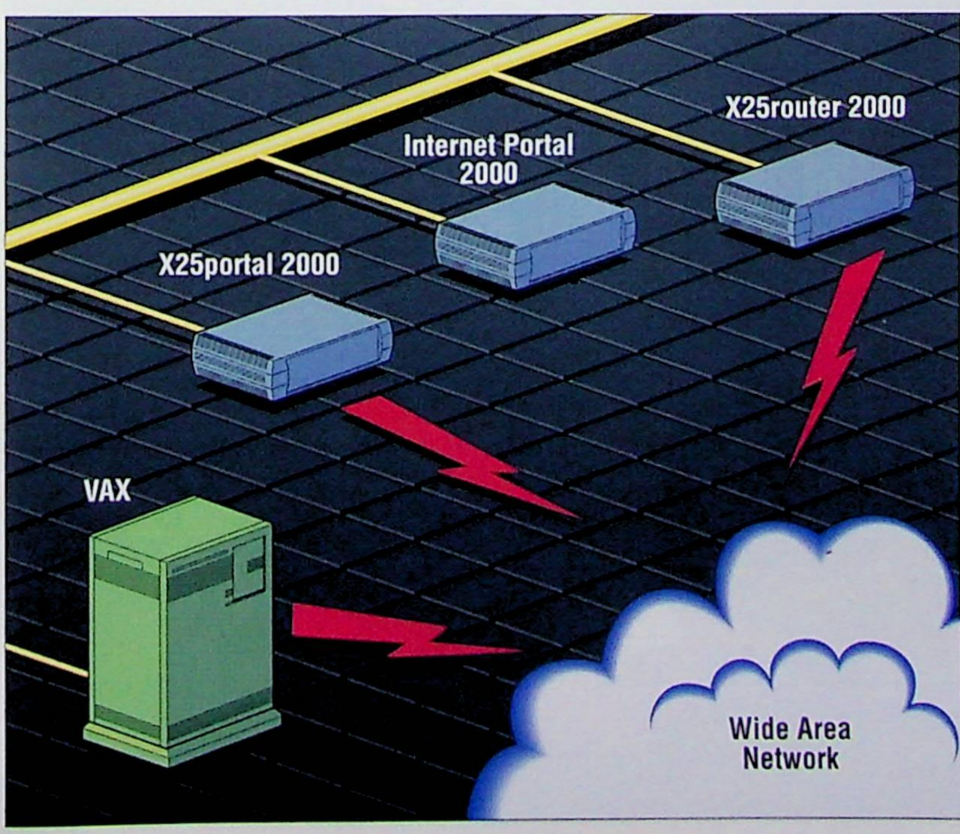
MEDIA	**QA-VIAAA-H5**	(TK50)
or	**QA-VIAAA-HM**	(Tape)

The licence for this software (QL-VIAA9-AA) is bundled with the X25router hardware, so no purchase is necessary (even from multiple load hosts). Access to the gateway is from VAX P.S.I. Access… see the *X25-Based Services* article.

Another connection method is the X25portal-2000 box, though the main purpose of this is to enable use of a DECnet/OSI backbone for carrying X.25 traffic. For people with an existing investment in cable plant used by DECnet, this allows the X.25 traffic to be carried between different points on the existing wide area network.

X25portal-2000 V1.0 — SPD 25.F9

MEDIA	**QA-VUHAA-H5**	(TK50)
or	**QA-VUHAA-HM**	(Tape)



Internet Portal for VMS

The Internet Portal allows you to use an existing investment in DECnet associated cable plant to carry TCP/IP protocol traffic. This permits TCP/IP traffic to travel across a DECnet/OSI Wide Area Network.

The Internet Portal Load Host Software downloads an Internet Portal box to achieve this for your community of UNIX or other TCP/IP compliant hosts.

Internet Portal VMS Load Host V1.0 — SPD 31.61

MEDIA	**QA-VZSAA-H5**	(TK50)
or	**QA-VZSAA-HM**	(Tape)

DECnet/SNA

Several connections to SNA-based systems are available. These include:

- VMS/SNA
- DECnet/SNA Gateway-ST
- DECnet/SNA Gateway-CT

Further details of Digital's DECnet/SNA products can be found in the *IBM Host Communications* article.

DECrouters

DECrouters allow any DECnet end node (VMS, ULTRIX or MS-DOS) machine to link onto an Ethernet via an asynchronous terminal connection. Part numbers are provided below.

DECrouter-200 V1.1 — SPD 27.72

LICENCE	**QL-VDJA9-AA**	(included)
MEDIA	**QA-VDJAA-H5**	(TK50)
or	**QA-VDJAA-HM**	(Tape)

DECrouter-250 V1.1 — SPD 32.15

MEDIA	**QA-YG6AA-H5**	(TK50)
or	**QA-YG6AA-HM**	(Tape)

DECrouter-100, 2000 VMS V1.2 — SPD 28.85

MEDIA	**QA-VI8AA-H5**	(TK50)
or	**QA-VI8AA-HM**	(Tape)

UNIX Connections

Further details on Digitals range of UNIX Networking Products can be found on Page 20.

VMS Printer and Terminal Connections

NEW VERSION 1.1

SHARE YOUR RESOURCES

DECserver-550, 3270 Options Software

LAT connections
The preferred way of connecting terminals to any Digital VMS or ULTRIX host is by use of a DECserver terminal server. Sitting on Ethernet and loaded from any VMS or ULTRIX load host, these devices allow users to connect to any machine on the local area network. The efficiency of Local Area Transport (LAT) protocol reduces host machine interrupt traffic; this is a licensable technology if you wish to build your own LAT-compliant devices.

In addition most Digital printers can be shared by connecting them to a terminal server. One logical printer queue can point multiple devices providing added availability.

Digital terminal servers now have licences included in the hardware package, so only a media kit is required to get them running.

IBM 3270 Terminal Option
Digital now provides line cards into which you can plug selected IBM 3270 CUT-mode (Control Unit Terminal) devices directly (co-ax onto the board). Digital Terminal Emulation software is provided on the terminal server card, allowing the 327x-based user to run either as a native Digital terminal, or to 'hot-key' to the existing IBM environment.

The DECserver-550 3270 Terminal Option Software licence is bundled with the hardware; only the media kit is required.

MUXservers
MUXservers offer the same range of services as Digital's terminal servers, but permit the connection of remote terminals, via a multiplexor.

New! DECserver 250 for Printers
The DECserver 250 is Digital's first network server to provide connections for both serial and parallel printers. Positioned anywhere on an extended Ethernet LAN, the printers can connect to:

- Two Dataproducts compatible parallel interfaces.
- Four asynchronous RS232 channels, two at up to 19.2Kb, the other two at 9.6Kb. A single port possesses modem control and, if desired, can handle a terminal on this line only.

Like other DECservers, the licences are included with the hardware.

RETOS
The VAX ReGIS to Sixels Converter (RETOS) is a software application that translates a ReGIS file into colour Sixel format. The primary use of this product is to enable output of colour graphics generated by a myriad of ReGIS based applications onto the LJ250 colour desktop printer.

DECserver-550, 3270 Opt. S/w. V1.1 — SPD 25.G5

MEDIA **QA-VV9AA-H5** (TK50)
or **QA-VV9AA-HM** (Tape)

DECserver-250 VMS Load S/w. V1.0A — SPD 25.J5

MEDIA **QA-VTMAA-H5** (TK50)
or **QA-VTMAA-HM** (Tape)

DECserver-200 VMS Load S/w. — SPD 27.53

MEDIA **QA-VCBAA-H5** (TK50)
or **QA-VCBAA-HM** (Tape)

DECserver-300 VMS Load S/w. — SPD 25.J1

MEDIA **QA-VTUAA-H5** (TK50)
or **QA-VTUAA-HM** (Tape)

DECserver-500/550 VMS Load S/w. — SPD 26.97

MEDIA **QA-03KAA-H5** (TK50)
or **QA-03KAA-HM** (Tape)

MUXserver-100 Load S/w. — SPD 28.45

LICENCE **QL-VE4A9-AA**
MEDIA **QA-VE4AA-H5** (TK50)
or **QA-VE4AA-HM** (Tape)

MUXserver-300, 310 Load S/w. — SPD 25.E9

LICENCE **QL-VT7A9-AA**
MEDIA **QA-VT7AA-H5** (TK50)
or **QA-VT7AA-HM** (Tape)

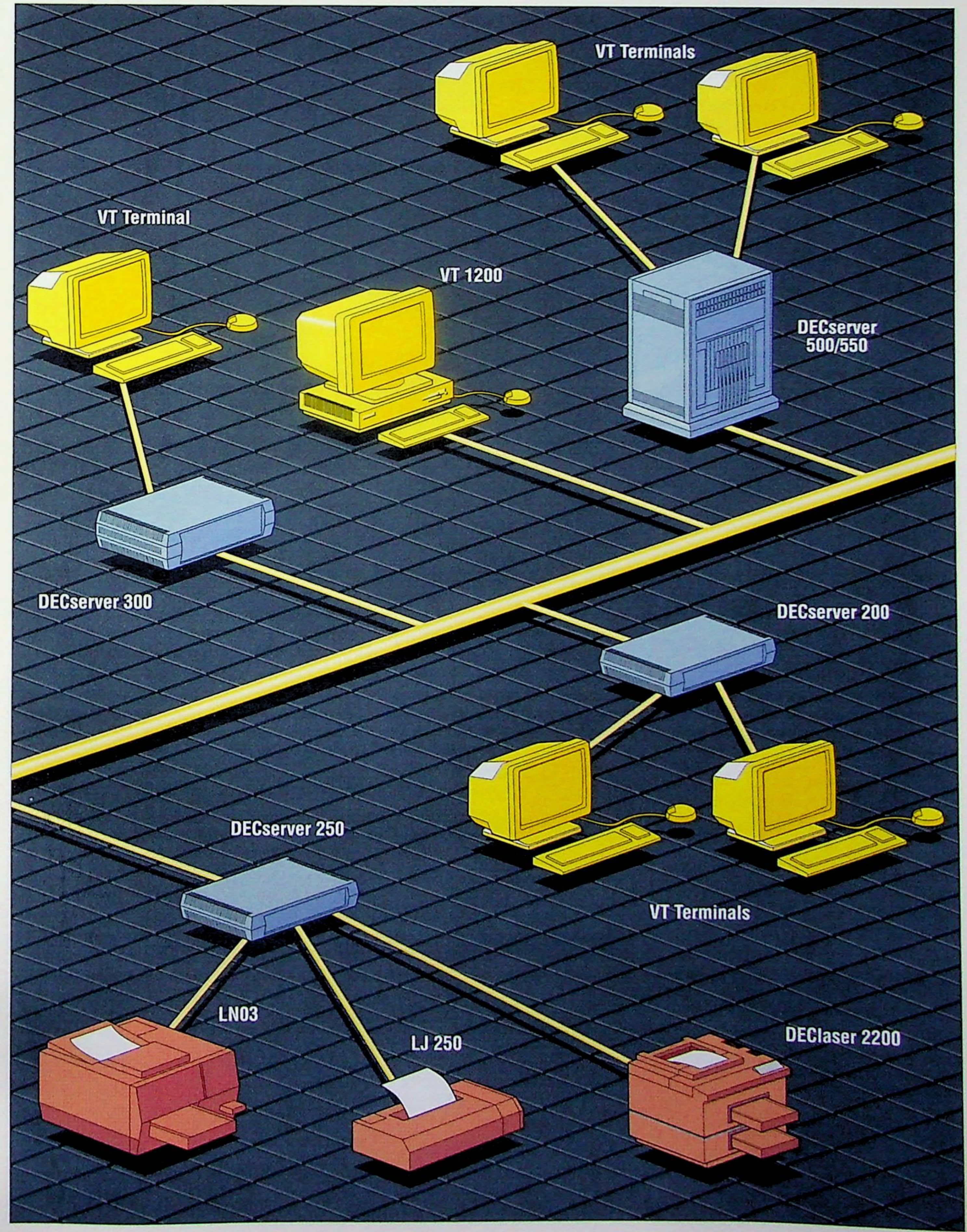
VAX RETOS V1.0 — SPD 27.88

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Hardware: VMS system with access to a Sixel compliant printer.
Installation: 600 blocks (300Kb). **Operation:** 600 blocks (300Kb).

TK50 **5** Tape **M**
MEDIA

LICENCE **QL-VEFA9-J** MEDIA **QA-VEFAA-H**
DOCS **QA-VEFAA-GZ**


VT Terminals
VT Terminal
VT 1200
DECserver 500/550
DECserver 300
DECserver 200
DECserver 250
VT Terminals
LN03
LJ 250
DEClaser 2200

DECprint architecture

NEW VERSION 3.2

PUTTING IT ON PAPER

PrintServer Load Software

Digital's design centres for laser printing technology include ANSI and the PostScript® page description language from Adobe (pronounced Ad-doe-bee). Increasingly, organisations are moving away from printing being local to just one processor, and instead are making use of networked print services.

Digital's DECprint architecture encompasses these base requirements, and will, over time, provide print interface protocols, software, runtime libraries and font/form resource servers across all Digital platforms. These services will also be made available on other selected hardware platforms, such as MS-DOS, OS/2 and Macintosh systems, making use of existing and emerging industry standards.

Many of the DECprint services are already available, and most of these are described here. Products such as VAX Distributed Queue Services and DECwrite are also part of this programme, but listed elsewhere in this catalogue.

ScriptPrinter Software V2.1

The ScriptPrinter Software works in conjunction with Digital's LN03R PostScript laser printer, which can be connected either to a standalone processor or to a terminal server port. The software builds several printer queues for you on installation, each of which feeds files through a specified translator:

ANSI with or without Sixel Graphics

ReGIS

PostScript

TEK 4010/4014

New! Subset DDIF image subset translator

Pointing a print job at the appropriate queue invokes the appropriate translator automatically; no other user intervention is required until it comes to remove the paper from the printer.

The licence for this software is included in the LN03R device. Only the media kit need be ordered, for one or more hosts:

ScriptPrinter Software V2.1		SPD 27.84
MEDIA	QA-VF9AA-H5	(TK50)
or	QA-VF9AA-HM	(Tape)

LN03 Image Printer: it's fast!

The LN03 Image Printer is functionally equivalent to the ScriptPrinter (LN03R), and indeed, requires the same ScriptPrinter Software (QA-VF9AA-H*). However, connection is to a Q-bus machine VAXimage Scanning Subsystem interface via RS422 synchronous video cable. These together permit a throughput of 5Mb/second... enough to feed the printer at a continuous 8 pages per minute.

The PostScript interpreter is resident in the host CPU, and needs to be ordered separately (this is known as the 'LN03 Image Support Software'). The licence for this is included with the hardware. Access from other hosts requires the presence of VAX Distributed Queue Services (DQS).

VAX LN03 Image Support S/w V1.0		SPD 31.52
MEDIA	QA-VZRAA-H5	(TK50)
or	QA-VZRAA-HM	(Tape)

PrintServer Software

Digital's PrintServers offer Ethernet-based, high-speed printing of documents. Like the ScriptPrinter software, the user has a variety of device queues at which different document formats (ANSI, ReGIS, PostScript, TEK 4010/4014) can be aimed. As an Ethernet device, the intelligence for the PrintServer is loaded at power-up by a VMS load host. Once loaded, client systems can direct print requests at the appropriate queue; the PrintServer client software (all licences bundled with the PrintServer hardware) needs to be loaded on each client system to achieve this. The PrintServer Load Software V3.2 also offers significant performance improvements over previous versions.

Part numbers required are:

PrintServer Load Software V3.2		SPD 27.68
MEDIA	QA-798AA-H5	(TK50)
or	QA-798AA-HM	(Tape)

PrintServer Client Software V3.0		SPD 27.67
MEDIA	QA-797AA-H5	(TK50)
or	QA-797AA-HM	(Tape)

DECprint™ Utility

The 'DECprint Utility for PostScript to Sixel Printing' allows users with an investment in LJ250, LA324, LA75, LA210 and LN03 Plus Printers the ability to output PostScript files. Printers may be connected to a host, or directly to the user's terminal.

This capability provides Colour PostScript output capabilities for LJ250 and LA324 printers.

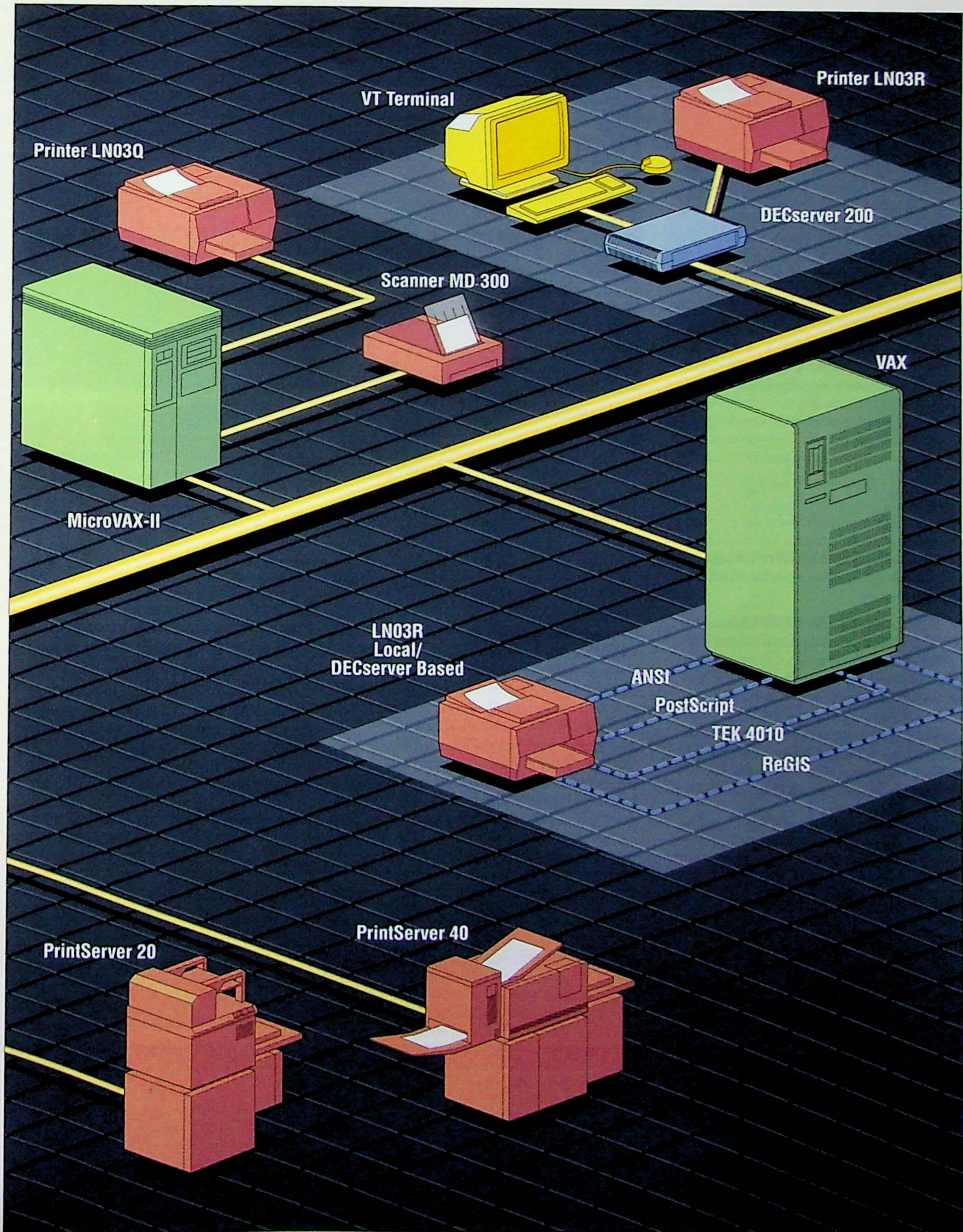
This breakthrough product completes the capability of printing virtually any file to a Digital printer. While the DECprint Utility for PostScript to Sixel Printing for VMS will not match the output speed or volume capabilities provided by Digital's dedicated PostScript Printers, it can provide access to PostScript printing for remote locations or when the confidentiality and convenience of a personal printer are required.

DECprint™ Utility V1.0		SPD 31.56
LICENCE	QL-VZPA9-PB	
MEDIA	QA-VZPAA-H5	(TK50)
or	QA-VZPAA-HM	(Tape)

Future Directions

The next version of the PrintServer Client software will have inbuilt Hewlett Packard LaserJet Emulation.

A more long term objective is the Common Print Symbiont, a VMS implementation of the "Printer Supervisor" component of the DECprint Architecture giving one symbiont for all types of printers. DECprint Printing Services V4.0 will be the first product with this goal in mind.



VT Terminal
Printer LN03R
Printer LN03Q
DECserver 200
Scanner MD 300
VAX
MicroVAX-II
LN03R
Local/
DECserver Based
ANSI
PostScript
TEK 4010
ReGIS
PrintServer 40
PrintServer 20

VAXcluster Options

NEW VERSION 5.4

DIGITAL'S FLEXIBLE APPROACH TO ADDING COMPUTING POWER

VAXcluster Software

A VAXcluster is a highly integrated configuration of several VAX computers operating together as a single VAX computer system. VAXcluster systems can contain a wide range of VAX hardware and use the same VMS operating system and application programs that run on a standalone VAX processor.

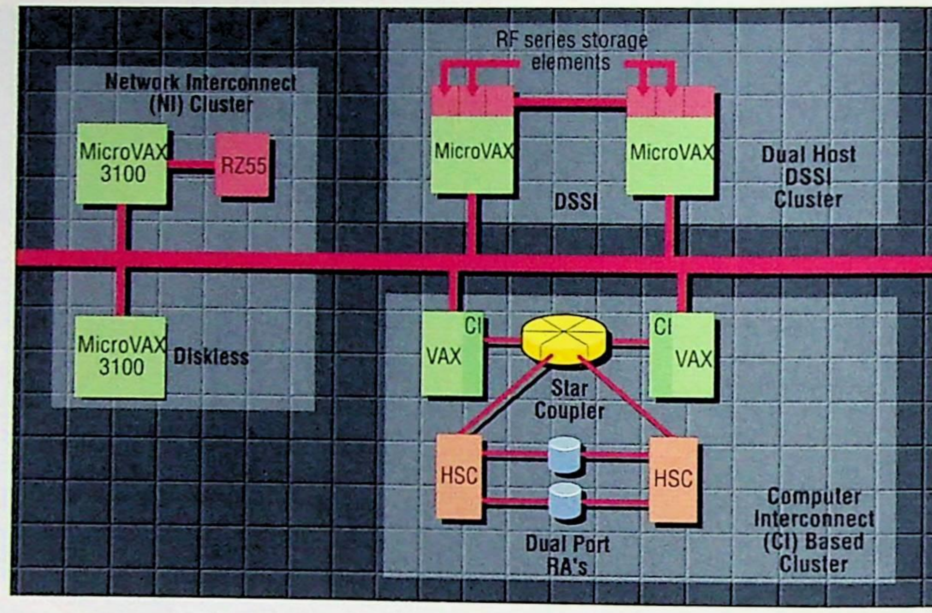
VAXclusters allow you to add processors and disk drives as your needs dictate, maintaining your current investment in capital equipment. The physical connection between VAXcluster processors can be through use of a Computer Interconnect (CI) bus for high-end machines, and/or via Ethernet.

All configurations have the following software features in common:

- Shared Disk Storage. The VMS file system allows all VAX processors in a VAXcluster to share disk mass storage, whether the disk is connected to an HSC-based Controller (on the CI-bus) or directly to an individual processor.
- Cluster-wide batch and print queues, accessible to any machine in the configuration. Jobs submitted to cluster-wide queues are routed to the least loaded system, balancing the batch load across the cluster members.
- Dynamic SHOW CLUSTER utility, displays node status, information and traffic.

CI VAXclusters

Computer Interconnect (CI) VAXcluster systems provide users with increased data sharing, high availability and increased computing power. As many as 16 VAX processors can be combined into a single CI VAXcluster system.



This mid-range VAXcluster uses redundant disk controllers to increase database availability. To get the full benefit of VAX Volume Shadowing, add a second HSC controller to your system.

Terminal Servers give VAXcluster systems a number of benefits, the most important of which is easy, transparent user access to any processor. Other advantages include:

- Dynamic load balancing across the VAXcluster for optimal resource utilisation
- Failover from a downed processor to a functional one
- Terminal locking for increased security
- Multiple simultaneous terminal sessions

Ethernet Network Interconnect (NI) VAXclusters

Ethernet-based or Network Interconnect (NI) systems enable you to integrate low-end systems and workstations into a VAXcluster environment. When configured, members of a workgroup or team can share common large disks, data and expensive peripheral devices and yet have a dedicated CPU.

The other chief advantage of NI VAXclusters is that system management is centralised including software installation, disk maintenance and backups.

Mixing it

A Mixed Interconnect VAXcluster is a combination of CI-based and Network Interconnect (NI) based machines in a VAXcluster configuration.

For the new Phase II Volume Shadowing, see the article *"Data Integrity and File System Performance"*.

VAXcluster Software V5.4 SPD 29.78

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System V5.3 & V5.2. DECnet-VAX software. All VAXcluster CPUs require either an End Node or Full Function DECnet-VAX Licence.

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-VBRA** [ ] **-AA**	MEDIA	Included in VMS
DOCS	Included in VMS		

VAX Volume Shadowing V5.4 SPD 27.29

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System V5.4. **Required Hardware:** Any Vax with MSCP-compliant DSA disks.

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-AB2A** [ ] **-AA**	MEDIA	Included in VMS
DOCS	**QA-AB2AA-GZ**		

Personal Computer Connections

PC-TO-VAX CONNECTION AND SERVICES

The personal computer has brought computing power to the desktops of people in many companies. In most cases, the resources of the company-wide computer network are unavailable to personal computer users. Digital's Personal Computer Systems Architecture (PCSA) is designed to retain the freedom afforded to each individual, and at the same time allow the sharing of information, capital equipment and related enterprise-wide services in innovative ways. PCSA offers:

- Integration of MS-DOS-based, OS/2-based and Apple Macintosh personal computers into the enterprise-wide network.
- Client/Server Model: LanWORKS for VMS on one or more VMS systems, with either LanWORKS for DOS for MS-DOS based clients or LanWORKS for OS/2 for OS/2 based clients; LanWORKS for Macintosh Server Software for one or more VMS systems and LanWORKS for Macintosh client for the Apple Macintoshes.
- VMS backup procedures automatically ensure integrity of host-based Personal Computer disk drives and files.
- Simple access from your personal computers to services and resources on your VMS system, including file sharing and print services.
- PCMAIL: MSDOS and OS/2 Personal computers can send electronic mail to any VAXmail user in the local or wide area network.
- PC DECwindows Display Facility provides an X-11 server implementation, turning an IBM, IBM compatible Personal Computer or Apple Macintosh into an X terminal (not currently available for OS/2).

The missing link

Digital's PC Systems Architecture is the way to link your existing IBM PCs and compatibles to your organisation's DECnet network. The VAX and MicroVAX computers can then act as application, data and print servers to your PCs, improving the flow of information around the company.

The PCSA Client/Server relationship

PCSA is based on a 'client/server' model; LanWORKS for VMS, a layered VMS application, is the server software on your VAX. The client software, running on the PC under MS-DOS or OS/2, is the LanWORKS client. Both systems use Digital's network software, DECnet, as the foundation. With DECnet each PC is treated as a true end-node peer in the network.

The client/server relationship allows the operating system for your PC to reside on the VAX. On request from the PC user, this software can be served to the PC client for execution. This approach allows one set of operating system, application and data files to be shared between all the PC client systems. In addition, other systems on the network can access the same data files.

PC Hardware Requirements

PCSA supports a wide variety of industry-standard Personal Computers. If you intend using PCSA on a PC that we have not verified, we normally ask that you reproduce any problem on any supported configuration on your network.

A single connection to the network is made using Digital's high-performance EtherWORKS Ethernet controllers; these require a single PC slot. The controllers also offer true 'diskless' remote boot of the PC. Some third-party Ethernet controllers are also supported by PCSA.

File services

Access to files stored on the server, for PC (both MS-DOS and OS/2 based), Apple Macintosh and VMS users, is provided by the file services. To the new user, the files simply appear as a transparent extension of the relevant client's local facilities. There is a comprehensive management facility for user-specific file access control.

Disk services

Disk services give access to high performance, DOS-formatted virtual disks, located on the server VAX in the local area network. The virtual drives appear to the MS-DOS or OS/2 user as standard MS-DOS disk drives (I:, J:, etc.). The high performance of the communications protocols used by PCSA disk services can make access to virtual disks as fast as using a local hard disk. System management tasks, such as backup of your DOS data, are improved thanks to the efficiency of the VMS System Manager (please note disk services are not applicable to the Apple Macintosh).

Remote Boot Services

MS-DOS based PCs using Digital's EtherWORKS Ethernet controller can be booted over the local area network without using any PC disk-based information. This has the added advantage that file security can be improved by using diskless PCs.

Print Services

PCSA gives your PCs access to the same networked printers as the VMS server. Printers may be attached to a terminal server or the VMS server, including a VAXcluster located on the network. Macintosh users and applications select and write to Digital printers in the same way they select LaserWriters connected to an AppleTalk network.

PCDISK Utility

This allows access to Disk Services from VMS, backup of disk services, command procedure modification of disk services and allows read/write access to MS-DOS format disks on suitable VMS drives (e.g.: RX23 or RX33).

PC DECwindows

The PC DECwindows facility is an MS-DOS application that implements an X server that uses the industry-standard X Window System™, Version 11 (X11), protocol. A DECwindows application executing on a remote VMS or ULTRIX system with DECnet may be displayed on and receive keyboard and mouse input from the PC.

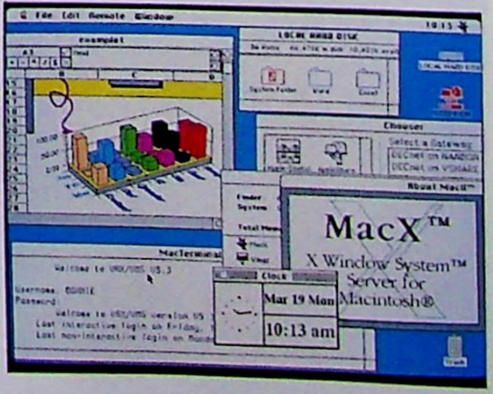
Network Management and Control

As well as having network functions available from your PC, the LanWORKS for VMS software provides services to enable management and control of the network. These services allow individual clients to connect to a server, provide the system administrator with access control capabilities, and also provide usage information.

Ordering LanWORKS for DOS Media

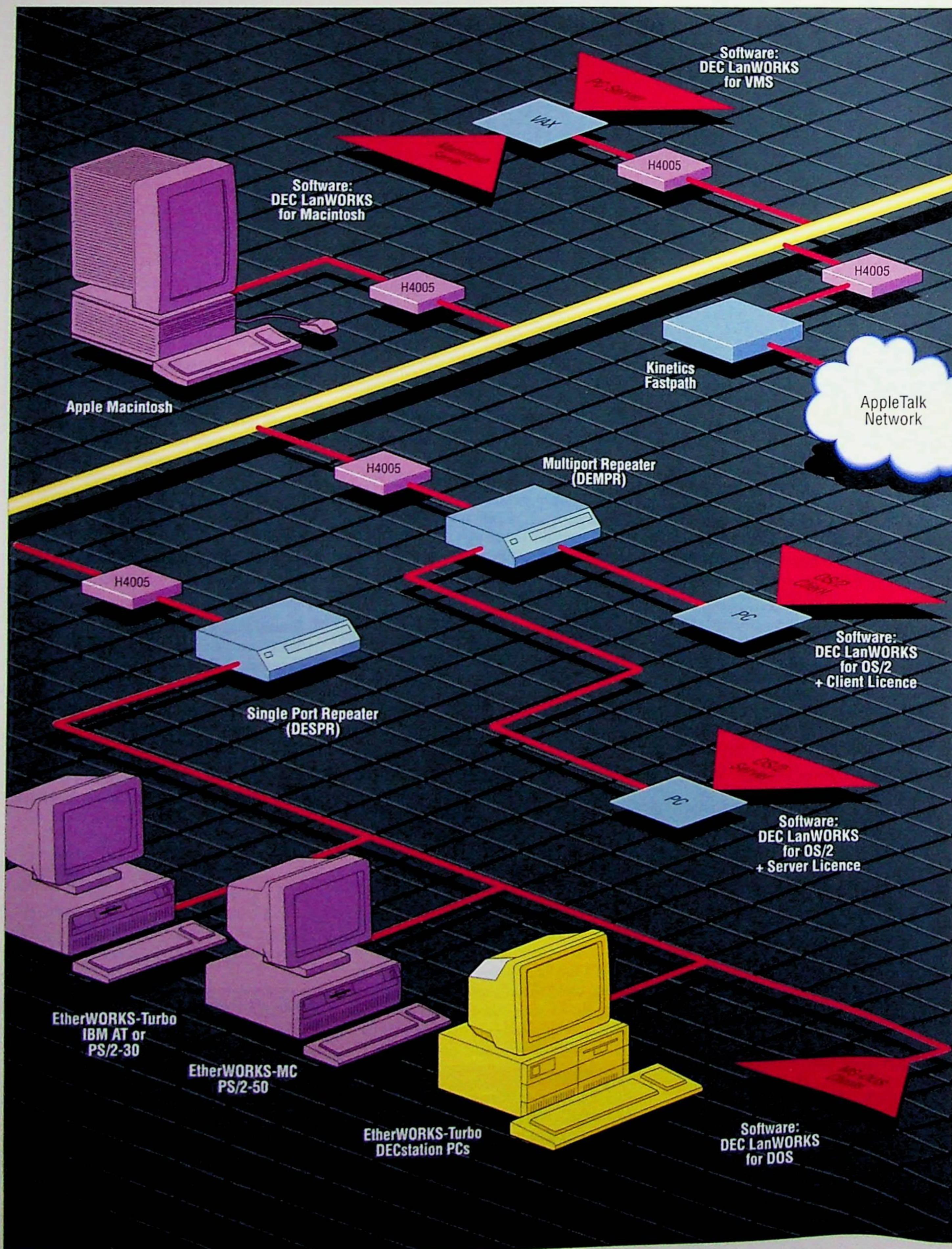
There are two main client installation options.

1. Installing the client software onto the VAX in a disk service and sharing it between all PCs. This method uses VMS Instal to create an MS-DOS format disk service, copies all the client software into it and then offers it as a service. You then connect to this service over Ethernet. For this method you order either an H5 or HM kit, both of which contain both 5.25 and 3.5 floppies for the initial connection to the VAX.
2. Installing the client software onto the local hard disk of each PC in its entirety using several floppies. This method is more involved and is only needed for non-Ethernet connections or if the server software is not used. Order either the HI or HB kit for this method.



Continued on page 39

Personal Computer Connections *(continued)*



NEW VERSIONS

DEC SoftPC for VMS & DEC LanWORKS for VMS

LanWORKS for OS/2 LAN Manager Server Capability

A Personal Computer running LanWORKS for OS/2 and having the Server Licence can be configured as an OS/2 LAN Manager server. The LanWORKS for OS/2 Server includes the following features:

- All OS/2 Client capabilities.
- File, print and communication services are offered to OS/2 clients running the LanWORKS OS/2 Client software.
- File and Print Services are offered to DOS clients which are running LanWORKS for DOS V3.0 software.
- OS/2 network resources such as mass storage and print devices are managed from the server. Access to specific resources can be granted to individuals or groups.
- Server administration capability is provided by the LAN Manager V1.0 NETADMIN utility.

LanWORKS for OS/2 supports the full set of LAN Manager Application Programming Interface (API) functions which allow the development and support of distributed applications.

DEC LanWORKS for Macintosh

DEC LanWORKS for Macintosh is a combination of VAX software and Macintosh software that allows a VAX system to act as a file, print, mail, database and application server to Macintosh computers.

Features include:

- VAXshare File Services: The Macintosh user is provided with access to remote VAX file systems as a transparent extension of the client's local disk facilities. VAXshare file services are compliant with the Apple Filing Protocol (AFP) Version 2.0.
- VAXshare Print Services: Remote printers appear to the Macintosh as a transparent extension of the clients. The VAXshare Print Services support the VAXshare print symbiont, which transfers data to an Apple LaserWriter printer.
- Data ACCESS Language: VMS Server, Macintosh client, and adapter for Rdb/VMS database, VAXlink and VIDA.
- Network based server management.
- Mail for Macintosh server and client.
- MacX X-Window System server.
- MacTerminal (V3.0) terminal emulator.
- AppleTalk for VMS Version 3.0.
- AppleTalk-to-DECnet transport gateway.
- DECnet for Macintosh.
- Macintosh Communications Toolbox.

DEC LanWORKS for Macintosh is supplied as one media kit for installation on the VAX. The Macintoshes see the installed software as another AppleShare volume and connect to it to get access to the client components.

Future Strategy

Digital will be releasing several products that continue to integrate personal computers into your enterprise-wide computer networks. These will include an ULTRIX Server, which will include similar functionality to the VMS product, and an X Windows Server for OS/2.

Digital will continue to provide and enhance this type of unified computing environment, enabling your users to reap the benefits of an enterprise that works together.

DEC SoftPC V2.2

The SoftPC software product provides a VMS, VAX ULTRIX or ULTRIX/RISC user with the ability to operate DOS-based software. SoftPC emulates an IBM™ PC AT system (real mode only) on top of the relevant machine's hardware and native software. A DOS application will function in the SoftPC environment in like manner to its function on an IBM PC AT, as long as it does not require special hardware, protected mode memory or copy-protected diskettes.

The performance of the SoftPC facility is dependent upon a number of factors as well as the speed of the processor upon which it executes. As an example a DECstation 3100 system will yield similar performance to an 8Mhz IBM PC/AT.

You can use any application with the SoftPC emulator given the above limitations. These are not Digital licensed, warranted or supported products. The user must comply with the terms and conditions of each application software licence agreement.

Emulated Environment

CPU: 80286. AT BIOS. *Operating System:* DOS version 3.3. Diskette: 3.5 in. high density read/write, low density read-only. 5.25 in. high-density read/write using real PC's floppy via SLAVEPC. Hard disk. C and D drives: up to 32 MB each. E drive uses native file system.

Communications port: COM1 and COM2 map to the system serial ports. *Printer:* LPT1, LPT2, LPT3 map to serial ports or spooled device. *Memory:* 640k or LIM 4.0. *Video:* CGA, HERCULES or EGA, or MDA on VT220. (VAX 3520 and 3540 is monochrome only). *Keyboard:* AT enhanced. *Mouse:* Microsoft bus mouse emulated.

The SoftPC products can run in a DECwindows environment, it is therefore possible to run the product on one machine and display the output on another.

A licensed user may operate up to 4 sessions of SoftPC on a CPU.

DEC SoftPC for VMS V2.2 — SPD 32.18

LICENCE	**QL-YNWA9-PB**	
MEDIA	**QA-YNWAA-H5**	(TK50)
or	**QA-YNWAA-HM**	(Tape)

Required Software: VMS 5.3 and DECwindows V2.0 where necessary. **Required Hardware:** SOFTpc needs 2Mb for its working set, any machine using DECwindows needs a minimum of 6Mb.

DEC LanWORKS for VMS V3.1 — SPD 30.50

LICENCE	Included in DECnet-VAX	
MEDIA	**QA-A93AA-H5**	(TK50)
or	**QA-A93AA-HM**	(Tape)

Required Software: VMS Operating System, DECnet-VAX. **Installation:** 4,500 blocks (2,250 Kb). **Operation:** 3,500 blocks (1,750 Kb).

DEC LanWORKS for DOS V3.0 — SPD 55.07

LICENCE	
MEDIA	(TK50)
or	(Tape)
or	(3.5" 720Kb Disk)
or	(5.25" 1.2Mb Disk)

Required Software: MS-DOS V3.3 or 4.0, PC-DOS V3.3. LanWORKS for VMS V3.0 or later. **Required Hardware:** A minimum of 640KB system memory. All base systems must have at least one diskette drive capable of reading 5.25 inch (360Kb) diskettes or 3.5 inch (720Kb) diskettes. **Operation:** Maximum disk space required for the installation of LanWORKS for DOS software is 10Mb (20,000 blocks) on the VMS Server.

DEC LanWORKS for OS/2 V1.0 — SPD 55.24

LICENCE Server	**QL-YLXAW-AA**
LICENCE Client	**QL-YFWAW-AA**
MEDIA 3.5" 1.44Mb Disk	**QA-YFWAA-HC**
or 5.25" 1.2Mb Disk	**QA-YFWAA-H7**

Required Software: OS/2 V1.0 or V1.1 **Required Hardware:** 80286 or 80386 based Personal Computer with local hard disk. Digital DEPCA, 3Com Etherlink II or 3Com Etherlink/MC Ethernet card. 4Mb of memory for client, 6Mb for Server.

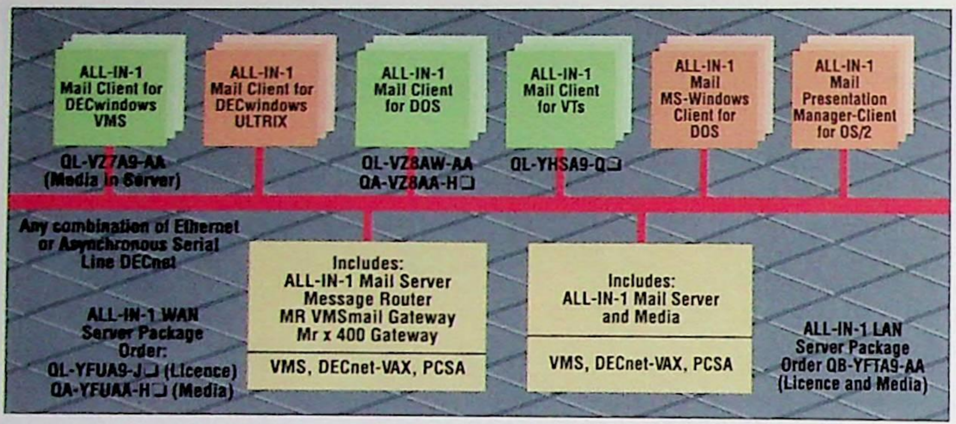
DEC LanWORKS for Macintosh V1.0 — SPD 31.53

LICENCE Server	Included in DECnet-VAX
LICENCE Client	**QL-YPH9W-AA**
MEDIA	**QA-YPCAA-H5**
or	**QA-YPCAA-HM**

For hardware and software requirements please call for SPD. Please note the Media kit for Macintosh includes both server and client software.

ALL-IN-1 Mail Products

INTER-ENTERPRISE DESKTOP COMMUNICATIONS



ALL-IN-1 Mail for DOS, ALL-IN-1 Mail for VMS DECwindows and ALL-IN-1 Mail for VT Terminals all have names that make most users assume that an ALL-IN-1 system is lurking somewhere in the background. In fact, this is not the case. ALL-IN-1 Mail Server Software sits on any DECnet-equipped VMS machine, and provides X.400-based message transport and distributed directory services for the respective client systems.

Features:

- A migration path for VMSmail and PCmail users to a native, inter-enterprise MAILbus environment.
- Store and Forward Mail service based on a 1984 CCITT X.400 'P2' compliant user agent.
- Access to Digital's Server-based Distributed Directory Service (DDS).
- File and Message attachments, including binaries and compound documents. Allows you to send spreadsheets or any other local application file to any other user.
- Remote dial-in for PC users enables mail to be collected and delivered in batches, for maximum convenience and minimum communications costs.
- Ability to reply to all TO:s and CC:s
- Direct VT Terminal access to the viewers and formatters provided by Digital's Compound Document Architecture (CDA™) programme.
- Support for VMSmail-style nicknames, distribution lists and addressing conventions.

Industry Standards

Based on full X.400 P2 recommendations, the clients give their users direct access to full, inter-enterprise, vendor-independent mail services. Users have the freedom to use their local editor of choice to compose their text, and are provided with both a personal address book and access to Distributed Directory Services present on the server.

Security

Security reflects the controls available on the ALL-IN-1 Mail Server host. With many people now purchasing small laptop computers, ALL-IN-1 Mail for DOS allows the automated batch processing of mail collection and delivery; the server connection is not required to read, file or create messages.

Packaging

ALL-IN-1 Mail Servers come in one of two flavours. If your users' electronic mail domain is restricted to one Local Area Network, Digital provides the ALL-IN-1 Mail LAN Server package. If your needs extend outside your local area network, we recommend purchase of the ALL-IN-1 Mail WAN Server Package (which contains the X.400 inter-enterprise mailing capabilities). ALL-IN-1 Mail clients can communicate with either type of server.

Add MAILbus Products as needed

As a member of Digital's range of MAILbus products, ALL-IN-1 Mail Server communicates with many other industry-standard mail systems. UNIX (via the ULTRIX Mail Connection), Telex, DISOSS and PROFS systems are all accessible as both the source and destination of mail traffic.

Mail capabilities are in addition to the normal terminal access, file transfer and print services available over DECnet from the client system of choice.

ALL-IN-1 Mail for VMS DECwindows V1.0

LICENCE	QL-VZ7A9-QB	(Need 1 per VAXstation)
MEDIA	Included in the ALL-IN-1 Mail Server Packages. Documentation must be ordered separately.	
DOCS	QA-VZ7AA-GZ	

Required Software: VMS with DECwindows. **Required Hardware:** Any VAXstation II, 2000, 3100,3200,35xx or 8000 with at least 8Mb Memory. **Installation:** 20,000 blocks (10.2Mb) **Operation:** 15,000 blocks (7.7Mb).

ALL-IN-1 Mail for Video Terminals V1.0 SPD 31.51

LICENCE	QL-YHSA9-QE	(for 8 named VT users)
or	QL-YHSA9-QG	(for 32 named VT users)
MEDIA	Included in ALL-IN-1 Mail Server Media, which is provided as a component of the ALL-IN-1 Mail Server Packages.	

Required Software: VMS Operating System. **Installation:** 20,000 blocks (10.2Mb) **Operation:** 15,000 blocks (7.7Mb).

ALL-IN-1 Mail for DOS V1.0 SPD 31.51

LICENCE	QL-VZ8AW-AA	(Need 1 per PC)
MEDIA	QA-VZ8AA-H5	(TK50)
or	QA-VZ8AA-HM	(Tape)
or	QA-VZ8AA-HB	(3.5" 720Kb disk)
or	QA-VZ8AA-H7	(5.25" 360Kb disk)

Required Software: MS-DOS V3.2, LanWORKS for DOS V2.2 or later. VAXmate V2.2 on server, VMS V5.2, LanWORKS for DOS V3.0. **Required Hardware:** 420 Kb free memory AFTER loading LanWORKS for DOS, with 1Mb disk space (or 3,600 blocks) if placed on VAXserver.

ALL-IN-1 Mail LAN Package V1.0 SPD 31.51

LICENCE + MEDIA (TK50)	QB-YFTA9-AA

Required Software: VMS Operating System. **Installation:** 20,000 blocks (10.2Mb) **Operation:** 15,000 blocks (7.7Mb).

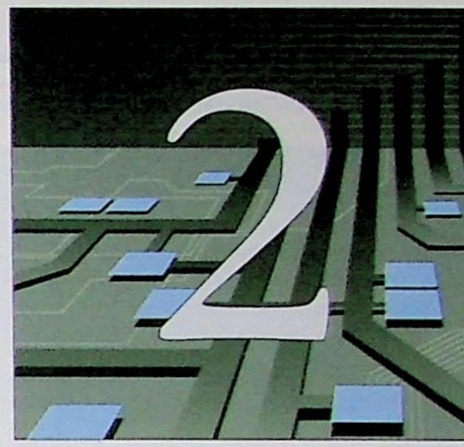
ALL-IN-1 Mail WAN Package Licence SPD 31.51

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. Note: VAX Message Router X.400 Gateway Media (QA-VDMAA-H5) must also be purchased to gain access to X.400 based services.

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-YFUA9-J❑	MEDIA	QA-YFUAA-H❑
DOCS	QA-YFUAA-GZ		



System management tools

Efficient systems and networks can increase productivity in an enterprise by making information readily available to those who need it, when they need it.

It's sometimes hard to determine just how much this contributes to the corporate bottom line — just as it's hard to quantify the productivity gained through inter-office mail, the telephone, or even electric power. However, as the movement of information becomes more critical to the operations of an enterprise, systems — and the network of which they form a part — are viewed increasingly as utilities.

A network is dynamic, not static. It expands, merges and grows, and its contribution to corporate efficiency can be enhanced through proper management. Several network management tools and utilities are integrated into Digital's standard operating and communications software. Digital also has a number of additional system and network monitoring products available; this section describes each product and its contribution to network efficiency.

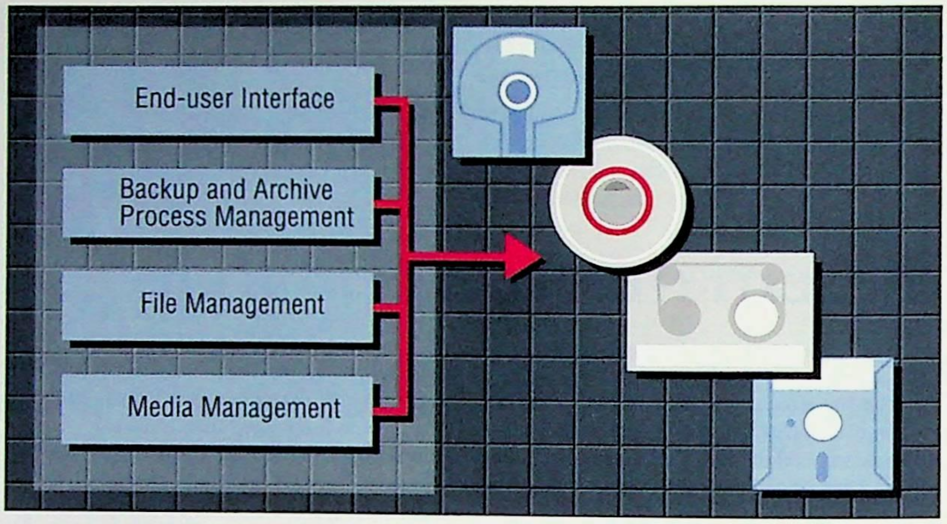
Further information on many aspects of network management, including administrative advice and technical tips, can be found in *"A Common Sense Guide to Network Management"*, published by Digital's Networks and Communications Group, part number EB-32496-42.

VAX Storage Library System

BACKUP, ARCHIVING AND MEDIA MANAGEMENT

VAX Storage Library System is a powerful back-up, archiving and media management tool.

- A single application to manage open-reel and cartridge tapes, removable magnetic media and optical disks.
- Provides an end-user interface to facilitate file storage and recovery requests.
- Round-robin usage of drives, to ensure even use of available media transport.
- New! Support of RV64 optical jukebox, allowing media mounting and file restoration without manual intervention.
- TA90 tape cartridge subsystem support added: during multiple-tape backups, SLS will ensure that each cartridge is scratch as it loads.
- Enhanced availability through automatic, fast failover in the event of problems with the primary SLS processor.
- Facilitates site-specific VMS Backup commands and automatic backup schedules.



The VAX Storage Library System manages the usage, allocation, tracking and control of removable reel-to-reel tape, cartridge tape and optical disk platters.

Removable Media Management

SLS helps retrieve archived information quickly and easily by maintaining an online catalogue of files and their media locations. When users request that a specific file be restored, VAX SLS identifies the physical location of the file and requests mounting of the appropriate media on an available tape or RV20 optical drive. When used with the RV64 Optical Jukebox, VAX SLS can locate a file and instruct the Jukebox to mount and restore the file without operator intervention.

Protecting your asset in information

VAX SLS tracks media between the data centre and off-site storage. To prevent accidental media overwrites, SLS automatically verifies all labels and protection levels, reporting any inconsistencies to the operator. If the user does not possess the requisite access privileges to a mounted volume, SLS will not permit the operation to proceed.

Automatic Failover

In order to increase availability SLS users have the option of designating a secondary host which could pick up operations in the event of failure on the primary SLS machine. In both VAXcluster and DECnet network environments failover is automatic and fast.

IBM Data Interchange

VAX SLS allows operators to read and write both ANSI and IBM tapes. It will also translate EBCDIC (IBM) to ASCII (most other vendors') code and vice versa. This allows customers to use 9-track or TA90 cartridge tapes to move data back and forth between Digital and IBM systems. SLS can also validate, read and write ANSI labels. The software can read (but not validate) IBM labels, and can write unlabelled IBM tapes. SLS can even generate labels for reel-to-reel tapes.

Access to a central archive

VAX SLS is available as two separately licensed products, server (VAX SLS) and client (VAX SLS Remote). Code and documentation for both are provided in the VAX SLS media kit, with the appropriate licence key defining usage.

One VAX SLS node can serve many VAX SLS Remote machines, providing a central archive on your DECnet network. If automatic failover capabilities are required, both the server machines must have the VAX SLS software loaded.

VAX Storage Library System (SLS) V2.0 SPD 29.67

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 4,100 blocks (2.1 Mb) **Operation:** 3,500 blocks (1.5 Mb).

MEDIA	TK50 5	Tape M

LICENCE	QL-0L7A9-J	MEDIA	QA-0L7AA-H
DOCS	QA-0L7AA-GZ		

VAX Storage Remote V2.0 SPD 29.67

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. FMS Forms Driver. **Installation:** 3,800 blocks (1.95Mb) **Operation:** 2,900 blocks (1.5Mb) Additional disk space is required dependent on the number of different types of media and the number of files that SLS is managing.

MEDIA	TK50 5	Tape M

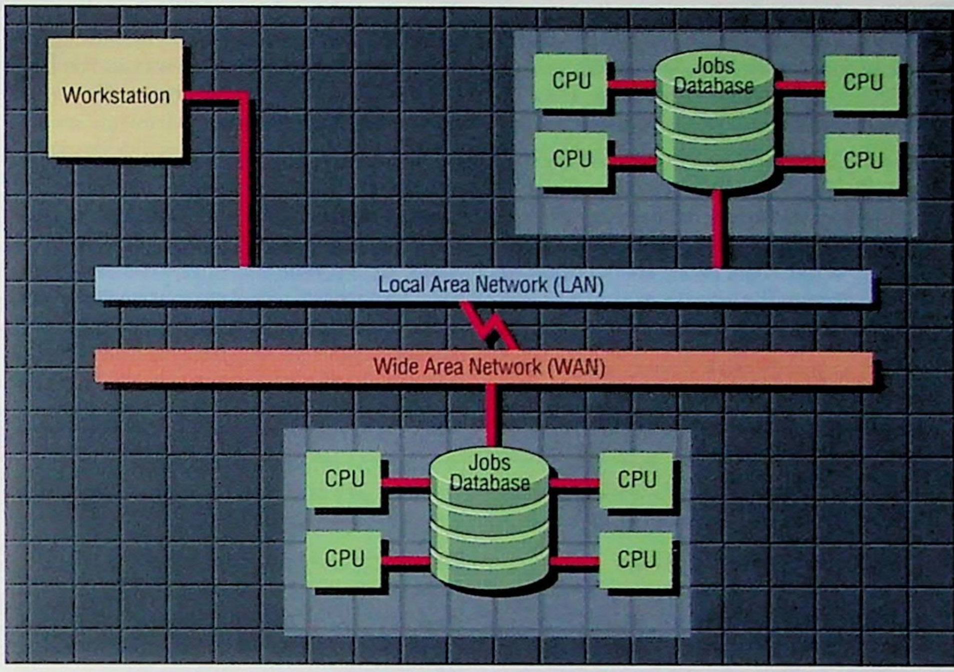
LICENCE	QL-YE8A9-J	MEDIA	QA-0L7AA-H
DOCS	QA-YE8AA-GZ		

DECscheduler for VMS

AUTOMATIC PRODUCTION JOB MANAGER FOR VMS

DECscheduler for VMS is a labour-saving distributed scheduling application that automates the execution of repetitive production jobs on VMS systems. It significantly reduces the amount of time system operators must devote to 'baby-sitting' processes. DECscheduler for VMS features:

- Automatic execution of repetitive jobs.
- Interrupted jobs are automatically restarted at the current step on another VAXcluster node.
- Supports processing on Local Area and Wide Area Networks.
- Each job can be synchronised with up to 16 others over the network.
- Automatically balances the job load within a VAXcluster, with user-modifiable parameters.
- Supports both a DCL interface and can integrate (via a callable interface) with application-specific programs.



DECscheduler automates the running of production jobs in a networked environment.

DECscheduler, though a V1.0 product, is already used at over 600 Digital installations worldwide. DECscheduler allows for more complex job scheduling with complete documentation and audit trails, resulting in substantial cost savings and better control over datacentre operations. It also helps productivity by bringing about significant reductions in manual effort and the errors this often introduces!

Use in Digital

DECscheduler is used inside Digital to automate repetitive tasks such as backup and file maintenance as well as more complicated job sequences.

Many Information Systems personnel use it to run daily, weekly (including unattended weekend) and monthly production jobs. Lag time between jobs is eliminated. DECscheduler has been key in realising personnel expense savings as the scale of the operation has grown.

Job Integrity and Failover

DECscheduler for VMS automatically handles time and job dependencies, even when the jobs are distributed over multiple, geographically dispersed machines. It also manages job-rescheduling calculations and notifies the operator of job runtime status as each job progresses (the current steps are displayed on an operator screen, or viewable at any time via a DCL command).

In the event of system failure, a job may be restarted at the current step on another node in the VAXcluster. However, the system manager also has the capability to restrict a job to running on a particular machine for security, resource requirement or for any other reason.

Integration with Applications

DECscheduler's callable interface allows application developers to customise their scheduling environment without having to develop specialised software within their application code. This interface gives the developer full access to the functionality in DECscheduler for VMS.

DECscheduler for VMS V1.0 SPD 32.19

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0-V5.3 **Required Hardware:** A TK50 Tape Drive is required for Standalone MicroVAX 2000 and VAXstation Systems. **Installation:** 5,000 blocks (2.6Mb) **Operation:** 4,000 blocks (2.05Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-YLLA9-J**	MEDIA	**QA-YLLAA-H**
DOCS	**QA-YLLAA-GZ**		

DECnet System Services

THE NETWORK IS THE SYSTEM

DECnet System Services is a collection of four discrete products designed to make a computer network operate as one complete computing environment. The products offer the following benefits:

- Users and applications distributed over several computers can access common file systems, independent of their geographic position (much like a Wide Area Network version of VAXcluster file access, though without locking facilities).
- High-capacity disk drives and printers can be shared cost-effectively by a community of autonomous systems.
- A Local Area Network-wide logical name service is provided.
- System management tasks associated with distributed VMS or VAX ULTRIX Systems are simplified, allowing provision of central system management services for the user community.

DECnet System Services (DSS) allows networked VAX computers to share file, printer and system management resources. DSS configurations can grow from just a few systems to hundreds of systems without major reconfiguration or disruption of service.

VAX Distributed File Services (DFS)

Distributed File Services allows users on many autonomous VMS systems to directly and efficiently access remote groups of files. Those users and their applications then have access to identical, up-to-the-minute information. For instance, you can use DFS to store documents, program sources or executable applications.

Because only one copy of a file may be needed, the total file storage required to support a group of systems can be decreased. DFS is completely transparent to VMS. DFS can be used to read and write files, and to perform directory operations, without users knowing that the actual file storage resides on another machine. DFS uses the distributed name service (DNS) to store information about the location of physical file storage. The use of DNS provides location independence: disk volumes can be moved from one machine to another, transparent to all users.

DFS offers excellent performance between systems connected by a LAN or high-speed wide area network connections, and is very close to the performance of Ethernet-based VAXclusters.

VAX Distributed Queuing Services (DQS)

VAX Distributed Queuing Services enables VMS systems to access printers that are connected to other VMS systems. DQS offers an efficient way for systems to share print resources.

Printing to remote printers is done using the same command and system service calls as local printing. DQS also provides commands to display the status of print jobs, and to delete entries from the queue. When printers are shared among systems using DQS they become network-wide resources.

Because DQS systems share printers, they require fewer of them, reducing initial investment and the resources required to manage them.

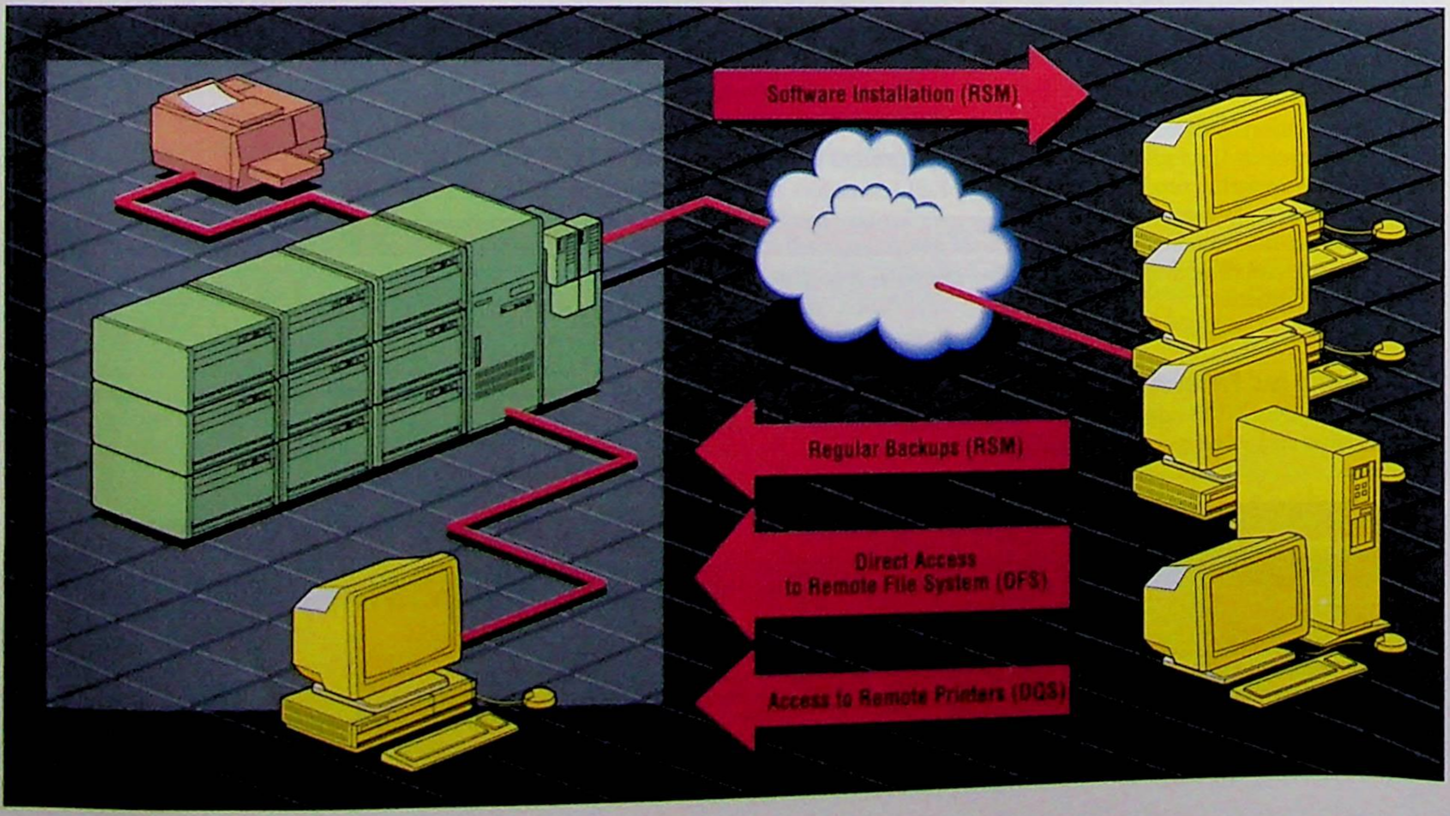
Remote System Manager (RSM)

Remote System Manager provides tools for managing a number of computer systems in a distributed environment over local or wide area networks. It allows a site to operate with fewer computer management resources than it might otherwise require.

RSM makes it simple to provide consistent copies of software to systems and reduces intervention by users. Software installation now becomes a service that can be offered to users by a site facility. With RSM, users can back up files with a minimum of effort. RSM maintains a schedule of backup times and instructions, and it starts the desired operations without manual intervention. Such automatic backups can become a service which can be offered to a collection of systems by a site facility.

An RSM installation can support hundreds of systems through a single management interface. In order to co-ordinate the multiple server systems required to support a large site configuration, RSM stores some

The Network is the System: DNS provides a LAN-wide Logical Name Service. DFS gives VAXcluster-like access and remote file systems anywhere on your DECnet-wide area network.



of its information by means of the Distributed Name Services (DNS). This allows RSM to be configured so that its services are available even if some of the server systems are down.

All of the VAX range of processors can participate as clients, and both VMS and VAX ULTRIX systems are supported.

VAX Distributed Name Services (DNS)

VAX Distributed Name Services provides a global naming service that stores certain types of information for DFS and RSM. DFS uses DNS to maintain information about the names, locations and groups of remote files. RSM uses DNS to store names and attributes of RSM server and client systems. Having multiple copies of such information enables the service to have higher reliability and better overall performance.

DNS call hold information about millions of entries and still provide efficient access and reliable operation. Thus DNS can support very large networks with many different applications storing information. DNS can be configured to use multiple computer systems, each running server software, to implement a single naming service. Each server holds only a portion of all the naming information that is available. Typically, information is stored closest to where it is most frequently read and modified, but all information can be accessed from any system in the network.

Information may also be replicated on several systems, and DNS will automatically update all copies of that information to reflect any changes.

Remote System Manager (RSM) Server V2.2 — SPD 29.59

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, DECnet-VAX and DNS. **Installation:** 26,000 blocks (13,312 Kb), **Operation:** 19,000 blocks (9,728 Kb). In addition to these figures, disk space will be used to store SDS libraries, backup files, and associated record keeping information.

TK50 **5** Tape **M**	LICENCE	QL-B13A[ ]-AA	MEDIA	QA-B13AA-H[ ]
MEDIA	DOCS	QA-B13AA-GZ		

Remote System Manager (RSM) Client V2.2 — SPD 29.59

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, DECnet-VAX. Required Disk Space: for VMS Clients, **Installation:** 1,400 blocks (716Kb), **Operation:** 500 blocks (256Kb). For ULTRIX clients, **Installation:** 1,400 blocks (700Kb), **Operation:** 550 blocks (275Kb).

TK50 **5** Tape **M**	LICENCE	QL-B14A[ ]-AA	MEDIA (Incl. in RSM Server)
MEDIA	DOCS	QA-B14AA-GZ	

VAX Distributed File Services (DFS) V1.2 — SPD 28.78

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, VAX DNS Distributed Name Services on each Node. **Installation:** 1800 blocks (900 Kb). **Operation:** 1600 blocks (800 Kb).

TK50 **5** Tape **M**	LICENCE	QL-VEQA[ ]-AA	MEDIA	QA-VEQAA-H[ ]
MEDIA	DOCS	QA-VEQAA-GZ		

VAX Distributed Queue Services (DQS) V1.1 — SPD 28.80

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System. **Installation:** 1400 blocks (717 Kb). **Operation:** 700 blocks (358 Kb).

TK50 **5** Tape **M**	LICENCE	QL-VENA[ ]-AA	MEDIA	QA-VENAA-H[ ]
MEDIA	DOCS	QA-VENAA-GZ		

VAX Distributed Name Services (DNS) V1.1A — SPD 28.79

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 7000 blocks (3,584 Kb). **Operation:** 7000 blocks (3,584 Kb).

TK50 **5** Tape **M**	LICENCE	QL-VERA9-J[ ]	MEDIA	QA-VERAA-H[ ]
MEDIA	DOCS	QA-VERAA-GZ		

VPA and SPM

SYSTEM TUNING AND CAPACITY PLANNING TOOLS

Digital markets two major products that provide a comprehensive range of Performance Management, Workload Management and Capacity Planning facilities. The tools are:

- VAX Performance Advisor (VPA) V2.0
- VAX Software Performance Monitor (SPM) V3.4

The overall difficulty of managing a computer system is that workloads, applications and hardware resources are constantly changed in line with increasing user needs. These tools help you tune, plan and budget the use of your VMS system, ensuring you have the right equipment at the right time and at the right cost — hence offering a continued cost-effective service to your user community.

Performance

System performance is monitored and analysed to ensure that, as workloads change, the best service levels can be achieved. If service levels degrade, tuning the system can often restore them, at least for a while. This is the major strength of the VAX Performance Advisor, VPA, which generates reports, on demand, that summarise actual or potential bottle-necks with suggestions for suitable courses of immediate action.

VPA operates on all VMS systems — from the smallest workstation to the largest VAXcluster. VPA will often suggest changes to SYSGEN parameters and, where storage is the bottle-neck, can identify 'hot files' to allow placement on the fastest disks in your configuration. These allow the system manager to attain improved performance in an efficient and effective manner, without recourse to detailed system tuning.

Workload

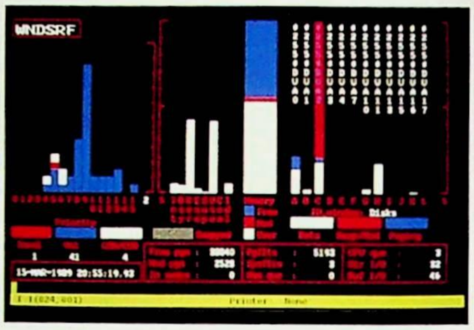
As workloads grow and the capacity limit of the system is approached, tuning no longer suffices. Solving this problem will often entail the collection of performance information to help a system manager re-distribute system workload intelligently, or provide evidence to support a longer manual tuning effort. This is the major strength of the VAX Software Performance Monitor (SPM).

SPM collects, displays, reports, archives, analyses and graphs performance information useful in system tuning and workload management. SPM also provides the capability for disk storage analysis (including fragmentation), resource charge-back, 'hot file' identification, and user-written event traces.

There are two VAX Software Performance Monitor (SPM) products available.

Full VAX SPM Facility

This consists of the data collector facility used to create the history files, as well as the data analyser. The knowledge based analyser detects and analyses performance bottle-necks from the history files. The analysis information includes:



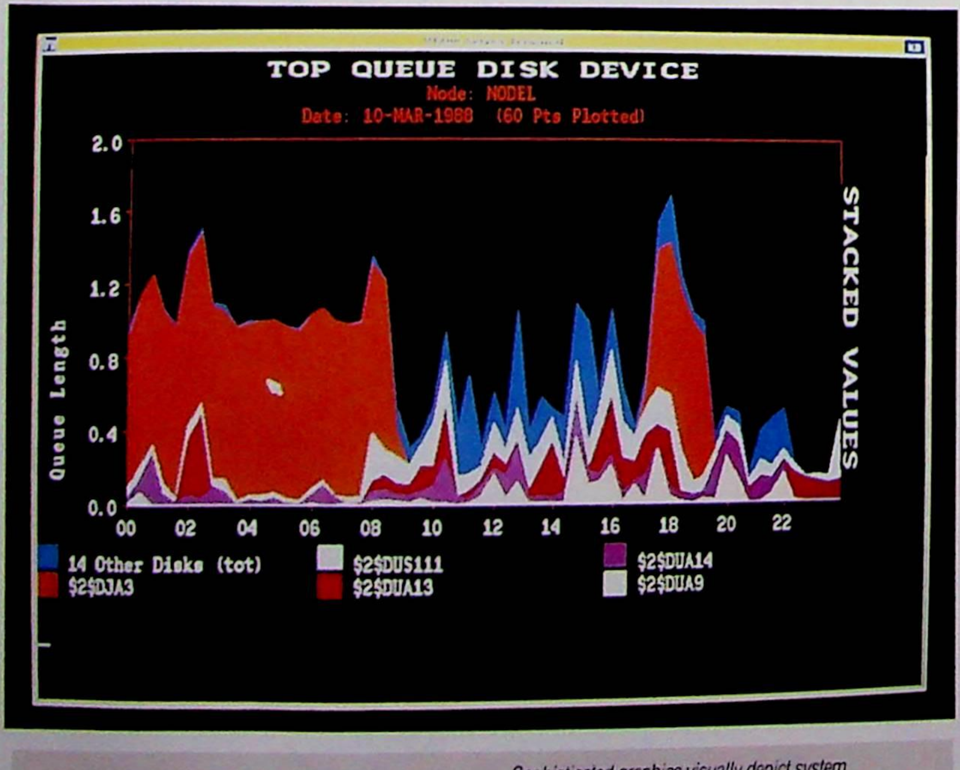
- A charge component that generates a report of charges based upon system and resource utilisation with user specified resource pricing.
- A system pc component that delineates CPU usage.
- A disk analysis component that describes disk volume utilisation and identifies files contributing to disk fragmentation.
- A hot files component that provides detailed file-level statistics necessary for disk load balancing.
- An event trace component that is suitable for collecting custom performance data and testing the performance of system software.

This information can then be used in several different ways: it can be dynamically displayed on a ReGIS terminal or printed out on a graphics printer.

VAX Software Performance Monitor Data Collector

This is a subset of the full product, providing the ability to create the history files only.

Thus it is possible to run just the Data Collector on all nodes in a cluster and run the full Performance Monitor on one for analysis.



Sophisticated graphics visually depict system characteristics and resource utilisation.

VAX Software Performance Monitor (SPM) V3.4 — SPD 27.56

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 18,000 blocks (9.2Mb). **Operation:** 11,000 blocks (7.0Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-850A9-J**	MEDIA	**QA-850AA-H**
DOCS	**QA-850AA-GZ**		

VAX SPM Data Collector V3.4 — SPD 27.56

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 5,000 blocks (2.6Mb). **Operation:** 2,000 blocks (1.0 Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VUPA9-J**	MEDIA	**QA-VUPAA-H**
DOCS	**QA-VUPAA-GZ**		

VAX Performance Advisor (VPA) V2.0 — SPD 27.71

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 7,600 blocks (3.8Mb). **Operation:** 4,000 blocks (2.0Mb). Sizes may vary depending on user selected sampling rates.

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VE5A9-J**	MEDIA	**QA-VE5AA-H**
DOCS	**QA-VE5AA-GZ**		

VAXcluster Console System

NEW VERSION 1.3A

ON- OR OFF-SITE MISSION CONTROL

The VAXcluster Console System (VCS) is a VMS layered product that enables dispersed VMS, VAXcluster and VAX ULTRIX systems (plus a wide variety of other equipment) to be controlled from a single interactive control centre. This control point may be located anywhere.

- Startup, Operator and System Management functions from one central location.
- Supports up to 32 CPUs, HSC controllers or other RS232-equipped devices.
- Saves computer room floor space by eliminating individual console devices attached to each CPU.
- Allows on-line, DECwindows multi-window review of current and time-stamped historical console data.
- Eliminates the need for an operator to correlate data from multiple hard-copy console listings.
- Alert messages communicated by DECtalk, On-Screen Icon colour change or by VAXmail.

Centralised control

VAXcluster Console System software (VCS) is a tool intended for customers who manage and/or operate CI VAX systems, whether or not the CI systems are in VAXclusters. VCS provides support for up to 32 system console lines. All data received from connected console lines is logged on the machine running VCS.

The VAXcluster Console System can be tailored to integrate with application-specific monitoring tasks. It can also be used simultaneously by several people, in different locations.

Above all, VCS allows you to locate your system management remotely from the computer devices themselves. This capability has been found to be extremely useful for 'Lights-out' environments, where the system is expected to run unaided for long periods. A system manager can have a terminal at home and have access to the system in the event of emergencies outside working hours, if this is appropriate to the needs of your organisation.

Licensing

The VAXcluster Console System is licensed on a 'per 4 connected machines' basis. For example, a 10-machine configuration would need 3 QL-V01A9-PD licences in order to operate correctly.

VAXcluster Console System V1.3A — SPD 27.46

LICENCE		**QL-V01A9-PD**	
MEDIA		**QA-V01AA-H5**	(TK50)
	or	**QA-V01AA-HM**	(Tape)

Required Software: VMS Operating System. Because of the nature of this product, it is recommended that it runs on a dedicated VAX processor. **Installation:** 4,500 blocks (2.5Mb). **Operation:** 2,000 blocks (1.0Mb), plus 3500 blocks (1.8Mb) per node for a month's worth of data.

Network Management Tools

EMA PRODUCTS TO HELP MANAGE YOUR CRITICAL NETWORK ASSET

On July 9, 1990, at DECworld, Digital announced the first wave of EMA-compliant DECmcc Director products. The relationship between EMA and DECmcc is similar to that between DNA (the Digital Network Architecture) and DECnet (the family of products that implement DNA): EMA is an architecture and DECmcc is the family of products that implement EMA.

The first DECmcc Director runs on VMS and the family of products includes:

The DECmcc Director package integrated with DECnet-VAX

This package provides the open interfaces, basic management applications, consistent user interface, and common structure for management information using a command line. This will be enhanced in V1.1 in the form of a user-friendly DECwindows-based iconic map with pull-down menus.

This interface is combined with an executive which controls the Management Information Repository (MIR), an object-orientated database. It includes the Control and Registration Functional Modules and DECnet/OSI Phase V DECnet Phase IV Access Modules. The licence for this product is included with DECnet-VAX; only the media kit needs to be purchased.

DECmcc Basic Management System

This includes the DECmcc Director above and adds the Ethernet Station Access Module and LAN Bridge Access Module. The Ethernet Station Access Module provides the pathway to manage any multi-vendor device on the Ethernet that conforms to ISO 8802-3 or IEEE 802.3 standards. Additionally, this module helps populate the MIR from an existing ETHERnim database.

The LAN Bridge Access Module allows the user to control any LAN Bridge 100, 150 or 200 in an extended network and provides a transition tool to help populate the MIR from an existing RBMS database.

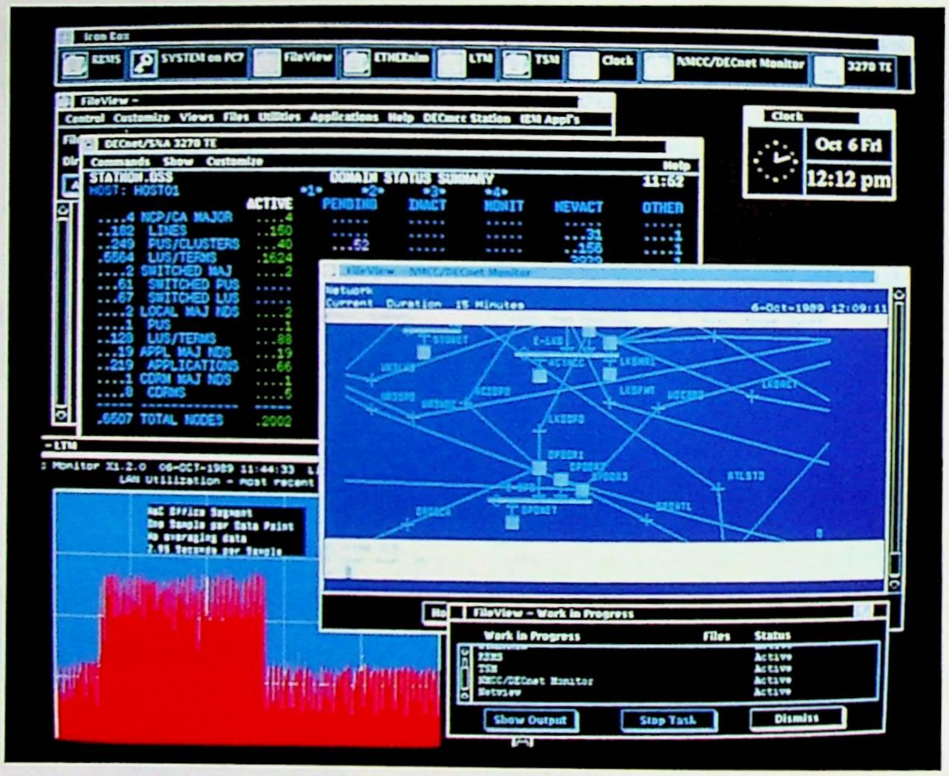
DECmcc Site Management Station

A transition package including 'pre-EMA' enterprise management products (TSM, ETHERnim, DECelms and LTM) as well as the Basic Management System. Customers with V1.0 of this product and a valid Layered Product Support Service will have DECelms provided as part of this service.

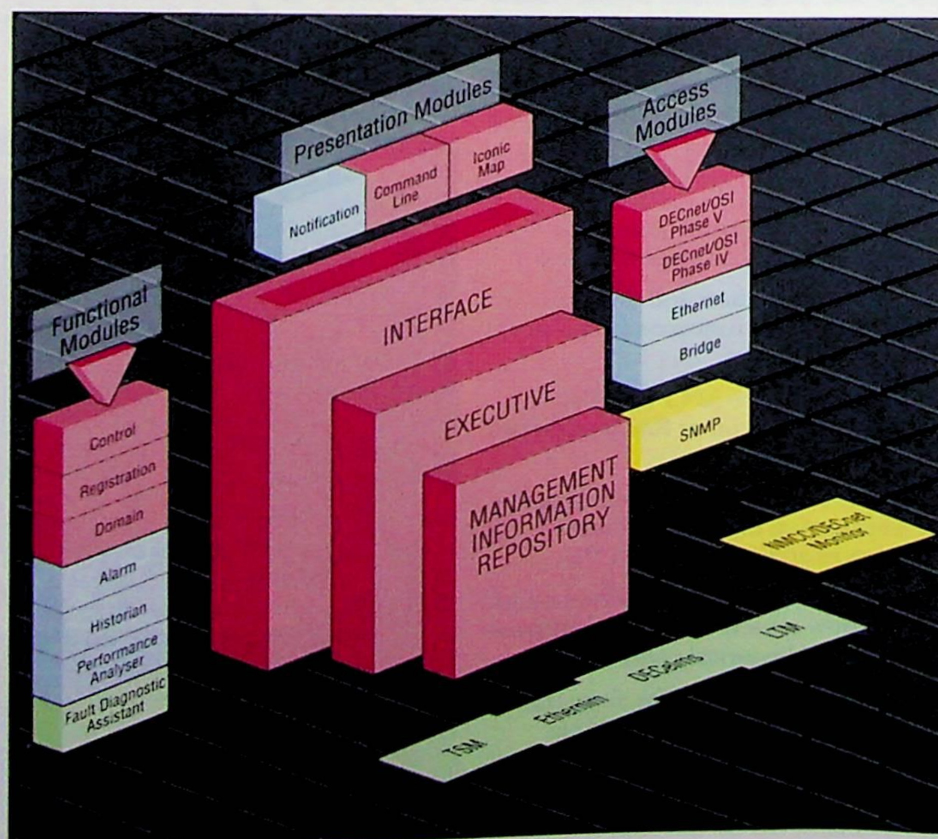
DECmcc Enterprise Management Station

The second transition package including all the features of the Site Management Station with the addition of NMCC/DECnet Monitor.

DECmcc TCP/IP SNMP is available as a separate Access Module. The Simple Network Management Protocol (SNMP) has become the de facto standard for managing TCP/IP network components.



The DECmcc Enterprise Management option provides all the components of the Site Management option plus NMCC/DECnet Monitor V2.2. Note that the user here has also installed the optional DECwindows 3270 Terminal Emulator, allowing IBM's NetView product to be used alongside Digital's Network Management Tools. The components are purchased as a total package (Part Numbers QL-YFVA9-AA/QA-YFVAA-H5).



Digital's family of Network Management Tools.

NEW VERSION 1.0

DECelms

Associated with SNMP is a standardised set of manageable objects defined in the Management Information Base (MIB). The two services offered are reading from and writing to MIB objects (the MIB standards are RFC 1065 and 1066).

V1.1 of DECmcc Director Products will follow very shortly. It is therefore strongly recommended that customers consider taking out a Software Product Service contract to ensure a cost effective upgrade.

The DECmcc Director products are used in conjunction with the existing Network Management Products in the Management Stations. These are briefly described below.

DECelms V1.0

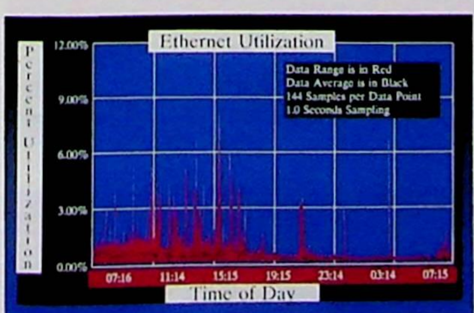
EXTENDED LAN MANAGEMENT SOFTWARE

DECelms (Extended LAN Management Software) enables a network manager at a remote VMS management station to manage, monitor, control and troubleshoot Digital network devices on hybrid 802.3/Ethernet and FDDI extended local area networks (LANs).

Features:

- Remotely manages, monitors and controls FDDI and IEEE 802.3/Ethernet interconnect products for the extended Local Area Network (LAN).
- Implements FDDI ring mapping and access to FDDI SMT.
- Provides automatic device polling, error detection, and registry of network devices.
- Supersedes and replaces RBMS V2.0; accepts RBMS, DECmcc Enterprise Management Station, DECmcc Site Management Station, and DECelms as valid licenses.

An extended LAN traditionally consists of multiple LANs that logically operate as one large local area network. Today, 802.3/Ethernet LAN Bridge products form the primary building blocks of the extended 802.3/Ethernet LAN. The advent of FDDI products expands the meaning of extended LAN. The DECconcentrator 500 is the primary building block of the FDDI LAN.



LAN Traffic Monitor's reports include detailed network utilisation graphs.

The DECbridge 500 allows 802.3/Ethernet and FDDI local area networks to transparently communicate and inter-operate as a hybrid extended LAN.

DECelms software runs on VMS host systems. Corresponding firmware resides in the target network devices. Digital 802.3/Ethernet bridges managed by DECelms are located on the extended 802.3/Ethernet network. DECconcentrator 500 and DECbridge 500 devices connect to the FDDI network, communicating transparently with the 802.3/Ethernet LAN through one or more DECbridge 500 units. DECelms is fully supported when installed on any valid and licensed VAXcluster configuration without restrictions.

Migration support

DECelms V1.0 replaces Remote Bridge Management Software (RBMS) V2.0 as both a standalone layered product and on DECmcc Network Management Stations (SMS and EMS). The DECelms installation procedure accepts RBMS, DECmcc Enterprise Management Station (EMS), DECmcc Site Management Station (SMS), and DECelms licenses as valid.

RBMS customers with a valid Layered Product Support Service contract and MDDS (Media and Documentation Distribution Service) option will have their update service fulfilled with DECelms in July, 1990. Customers without update contracts can purchase the DECelms H-kit.

LAN Traffic Monitor (LTM)

CAPACITY MANAGEMENT FOR LANs

LAN Traffic Monitor (LTM) is a tool used in multi-vendor environments to analyse the utilisation of an extended LAN.

- Monitors performance and bandwidth utilisation of multi-vendor Ethernet/IEEE 802.3 LANs.
- Provides an up-to-the-minute graphic display of LAN utilisation.
- Displays network traffic by system and by protocol, independent of vendor.
- Provides timely, accurate information needed to maximise network performance and plan network growth.

LAN Traffic Monitor works in conjunction with a LANbridge 100 and, optionally, DECelms (Extended LAN Management Software).

NMCC/VAX ETHERnim

MULTI-VENDOR LAN MANAGEMENT

NMCC/VAX ETHERnim enables you to locate and correct faults, and maintain an up-to-date configuration for your multi-vendor extended LAN.

DECmcc Base Mgmnt. System V1.0 — SPD 32.48

LICENCE	QL-YSUA9-AA	
MEDIA	QA-YSUAA-H5	(TK50)
or	QA-YSUAA-HM	(Tape)

Required Software: VMS Operating System V5.2-V5.3, DECnet-VAX V5.2-V5.3, VAX Distributed Name Services (DNS). **Required Hardware:** A DECwindows supported colour terminal is required; otherwise, a VT24X, VT330, or VT340 Terminal is required for systems with no DECwindows interface. Please note V1.0 only has a command line interface, V1.1 has full screen functionality.

DECmcc Site Management V2.0 — SPD 31.87

LICENCE	QL-YGLA9-AA	
MEDIA	QA-YGLAA-H5	(TK50)
or	QA-YGLAA-HM	(Tape)

Required Software: VMS Operating System V5.2-V5.3, DECnet-VAX V5.2-V5.3, VAX Distributed Name Services (DNS). **Required Hardware:** A DECwindows supported colour terminal is required; otherwise, a VT24X, VT330, or VT340 Terminal is required for systems with no DECwindows interface.

DECmcc Enterprise Mgmnt. V2.0 — SPD 31.88

LICENCE	QL-YFVA9-AA	
MEDIA	QA-YFVAA-H5	(TK50)
or	QA-YFVAA-HM	(Tape)

Required Hardware: Minimum Recommended Configuration. A VAXstation 3100 with 20Mb of memory and one RZ55 (332Mb) disk drive. **Required Software:** VMS Operating System. **Installation:** 56,200 blocks (28.80Mb) **Operation:** 55,200 blocks (28.30Mb) VAX Distributed Name Services (DNS). **Minimum Recommended Configuration:** A VAXstation 3100 with 16Mb of memory and 2 RZ23 disk drives. **Installation:** 10,900 blocks (5.6Mb). **Operation:** 9,900 blocks (5.07Mb).

DECelms V1.0 — SPD 31.79

LICENCE	QL-YFPA9-AA	
MEDIA	QA-YFPAA-H5	(TK50)
or	QA-YFPAA-HM	(Tape)

Required Software: VMS 5.2 or greater. **Optional Software:** LAN Traffic Monitor.

LAN Traffic Monitor V1.2 — SPD 27.80

LICENCE	QL-VEHA9-AA	
MEDIA	QA-VEHAA-H5	(TK50)
or	QA-VEHAA-HM	(Tape)

Required Software: VMS Operating System. **Installation:** 1,100 blocks (0.55M bytes). **Operation:** 600 blocks (0.3M bytes).

NMCC/VAX ETHERnim V2.2 — SPD 26.96

LICENCE	QL-514A9-AA	
MEDIA	QA-514AA-H5	(TK50)
or	QA-514AA-HM	(Tape)

Required Software: VMS Operating System. **Installation:** 4000 blocks (2M bytes). **Operation:** 5000 blocks (2.75M bytes).

continued overleaf…

NEW VERSION V2.3

NMCC/ DECnet Monitor (Base)

It features:

- Management tool for extended multi-vendor local area networks.
- Builds a permanent database containing basic information about each node directly connected to the local area network.
- Provides a means of path testing to ISO levels I and II to all (multi-vendor) nodes on the Ethernet (excluding MicroVAX I and VAX station I) and to DNA network application and user layers for any node running Phase IV on the Ethernet.

NMCC/DECnet Monitor

MANAGEMENT OF DECNET WIDE AREA NETWORKS

NMCC/DECnet Monitor helps you monitor, control and diagnose problems on DECnet wide area networks. It focuses on performance, configuration, and fault management to provide accurate and timely information for the entire network via an easy to understand graphical interface.

- Network topology is displayed as a logical map for easy recognition of network elements and potential trouble spots.
- Visual displays of configuration and performance data simplify interpretation and speed of troubleshooting.
- Relational database capability provides for either active or passive collection of data.
- Realtime event logging with configurable thresholds.
- Colour-coded alarms indicate when and where fault conditions occur.
- Graphical display of information helps users analyse trends.
- Line charges can be updated and adjusted for cost/performance assessments.

Terminal Server Manager

CENTRALISED CONTROL OF YOUR TERMINAL SERVERS

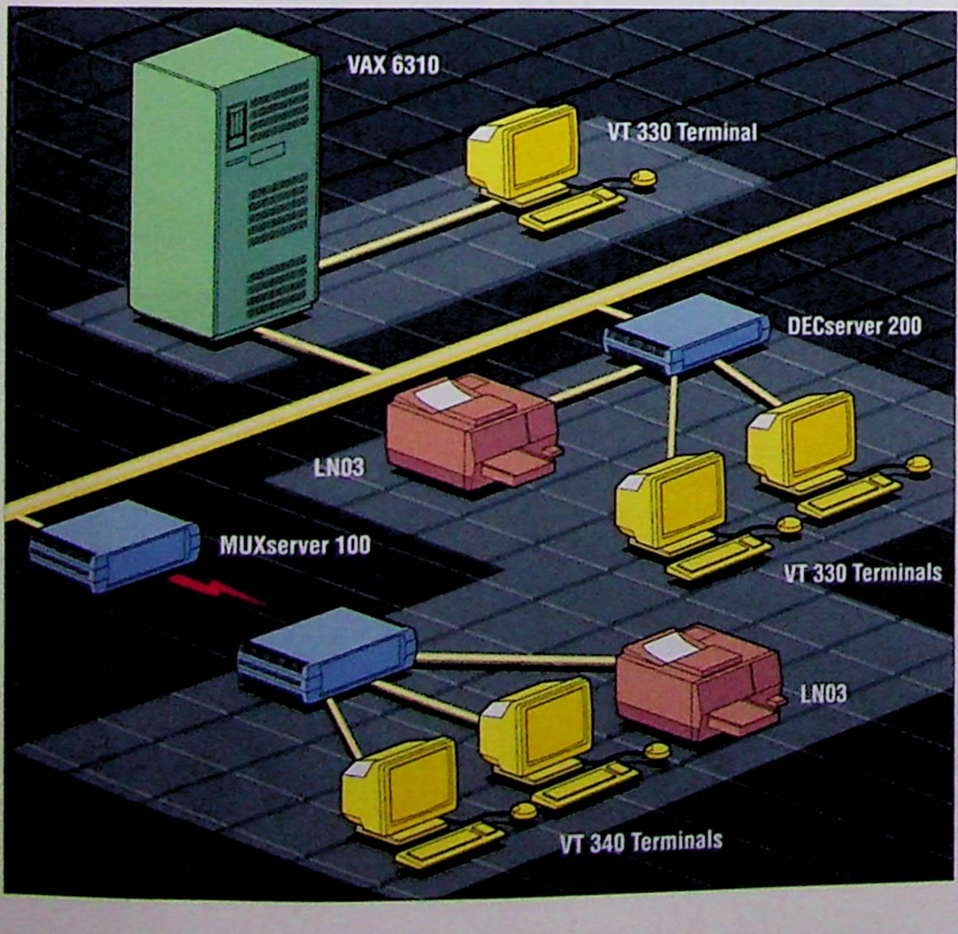
Terminal Server Manager (TSM) simplifies the management of large terminal server networks by streamlining procedures and reducing the need for trained personnel. Features include:

- Provides centralised observation, configuration and control of all Digital terminal servers in an extended LAN.
- Measures response time from server to host, helping locate problems especially in extended LAN configurations.
- Automatically updates the DECnet database with information about each terminal server on the network, allowing easy access to all servers by name rather than address.

TSM allows the manager to configure, monitor, and control Digital's family of terminal servers including the DECserver 100, 200, 300, and 500/550, MUXserver 100,300 and Ethernet Terminal Server.

TSM integrates the basic functions of DSVCONFIG in a product that allows the use of command files to help automate terminal server management. TSM exceeds the capabilities of NCP CONNECT in both configuration and fault management. By allowing a manager to group servers, TSM enables commands to be executed on a portion or all servers, thereby saving time.

TSM lets the manager configure, monitor, and control Digital's family of terminal servers from a central location.



NMCC/DECnet Monitor (Base) V2.3 — SPD 26.91

LICENCE	QL-VTGA9-AA	
MEDIA	QA-VTGAA-H5	(TK50)
or	QA-VTGAA-HM	(Tape)

Required Software: VMS Operating System, DECnet-VAX,Rdb and GKS Runtime. **Installation:** 45,000 blocks (22.5Mb). **Operation:** 45,000 blocks (22.5 Mb).

Terminal Server Manager V1.3 — SPD 27.64

LICENCE	QL-VDHA9-AA
MEDIA	QA-VDHAA-H5

Required Software: VMS Operating System and the appropriate DECserver or MUXserver load software for your configuration. **Installation:** 5000 blocks (2560 Kb). **Operation:** 3000 blocks (1536 Kb).

DECmcc WANdesigner V1.0 — SPD 32.45

LICENCE	QL-YMGA9-AA	
MEDIA	QA-YMGAA-H5	(TK50)
or	QA-YMGAA-HM	(Tape)

Required Software: VMS Version 5.2 or greater, DECforms VAX GKS. **Optional Software:** NMCC/DECnet Monitor.

DECmcc TCP/IP SNMP V1.0 — SPD 32.50

LICENCE	QL-YSVA9-AA	
MEDIA	QA-YSVAA-H5	(TK50)
or	QA-YSVAA-HM	(Tape)

Required Software: please call for SPD.

DECmcc DECnet Diagnosis FM V1.0 — SPD 32.51

LICENCE	QL-YSXA9-AA	
MEDIA	QA-YSXAA-H5	(TK50)
or	QA-YSXAA-HM	(Tape)

This product is available in February 1991.



Communications

Digital's wide-area networking products provide a seamless extension of local area networks, allowing users to easily access information anywhere within the enterprise.

Easynet, our own vast internal network, has served as our model for wide-area networking. It is one of the largest private data networks in the world, serving more than 47,000 CPUs on 498 sites in 31 countries. Of Digital's 114,000 employees worldwide, more than 70,000 are corporate-wide mail users. As we continue to grow Easynet, we are constantly improving its capabilities with product enhancements we can then offer to our customers. The products described over the next few pages are the results of this experience.

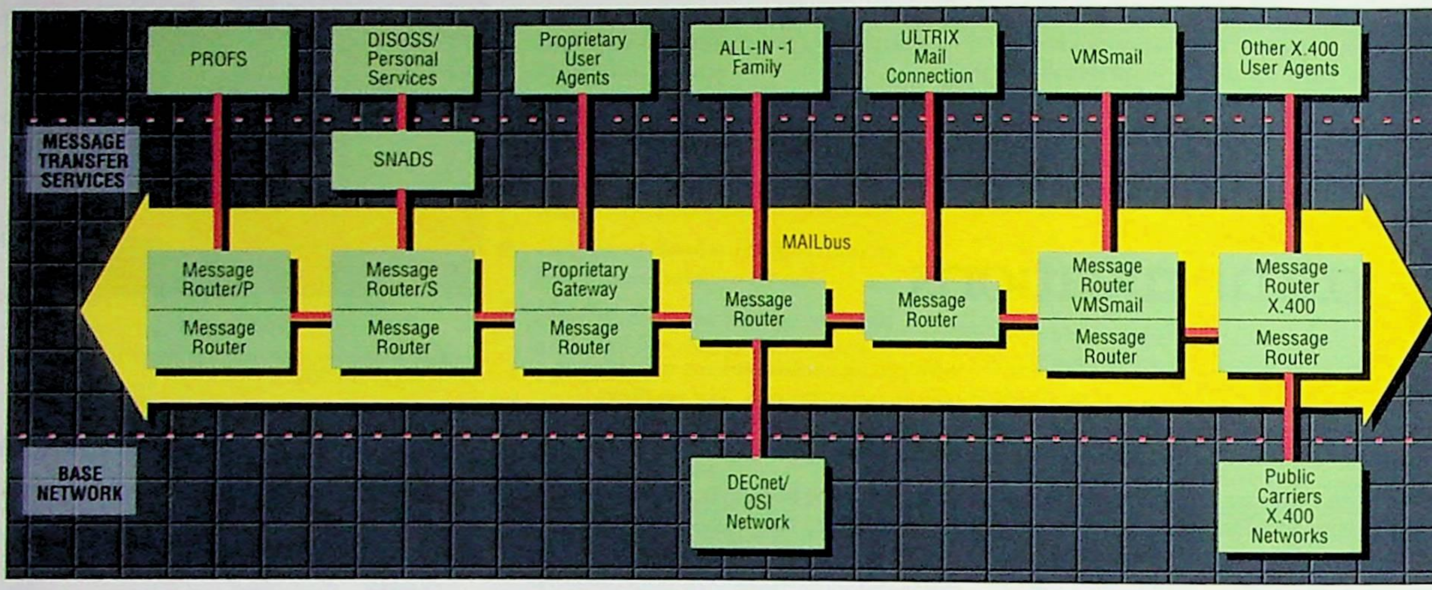
Customers who have, over the years, based their growth on the single-standard Digital hardware platform will tend to take transparent, inter-enterprise communications for granted. Users with the need for mixed networks including IBM mainframes, personal computers and UNIX systems can also link into this seamless computing environment.

MAILbus products

NEW VERSION 1.0A

ACCESS TO THE WORLD

VAX Message Router/T (Telex)



Digital's MAILbus products extend the power and reach of your organisation's communication systems, and help create an integrated user communication environment. MAILbus products can:

- Operate as Store and Forward Mail Message Routers.
- Provide seamless transfers between different electronic mail systems.
- Operate transparently with ALL-IN-1, VMSmail, X.400, PROFS (and CMS), TELEX, SNADS (DISOSS) and several UNIX-compatible transfer agents.

Designed as add-ons to the VAX Message Router Software (which is the core store-and-forward mail handler), the MAILbus software products include:

VAXmail

VMS comes with a basic electronic mail facility called 'MAIL'. This product does not provide store and forward capabilities; it requires that the target user's host machine be operational at the time of sending. To enhance MAIL with this capability, and use other MAILbus products, use Digital's Message Router VMSmail Gateway.

ALL-IN-1 Mail

ALL-IN-1 comes bundled with the Message Router and an electronic mail sub-system. Other Message Router products can be added to reach across to other mail environments.

X.400 Inter-Enterprise Mail

The Message Router X.400 Gateway provides a connection between your Digital systems and private and public mail systems that support CCITT standards. The Message Router X.400 software uses Gateway Directory Services to validate and address recipients of incoming mail, and to authenticate senders of outgoing mail.

IBM PROFS Office Systems

Message Router/P Gateway allows electronic mail and revisable and final-form documents to be transparently exchanged between the DECnet environment and IBM PROFS or IBM CMS in an SNA environment. Message Router/P need be installed on only one VAX in the DECnet Wide Area Network; from here it will serve all Digital systems that send or receive documents from the PROFS or CMS environments. Message Router/P uses a DECnet/SNA Gateway as a link between the Digital and IBM environments.

IBM SNADS-based Office Systems

Message Router/S Gateway allows the transparent exchange of electronic mail, revisable and final-form documents, between Digital and IBM Office Systems. IBM Systems 36, 38 and the IBM 5520 also support SNADS, though the connection between SNA and DECnet networks must be through the IBM mainframe.

Message Router/TELEX

Message Router Telex allows the other Digital MAILbus products to capitalise on the vast installed base of Telex machines present worldwide. Both outgoing and suitably tagged incoming messages can be handled. The interface to the telex network is via a third-party telex box that is available subject to local regulations.

ULTRIX Mail Connection

ULTRIX Mail Connection allows users of Digital ULTRIX and connected UNIX systems to exchange electronic mail with Digital systems and other environments. Using standard MAILbus products, the UNIX user is able to communicate with X.400, SMTP and IBM Office Systems via a suitably equipped DECnet network.

VAX Message Router/T (Telex) V1.0A SPD 29.96

LICENCE	QL-VAVA9-PD	
MEDIA	QA-VAVAA-H5	(TK50)
or	QA-VAVAA-HM	(Tape)

Required Software: VMS Operating System, Message Router Base (bundled in ALL-IN-1). **Installation:** 17,000 blocks (8.7Mb). **Operation:** 7,000 blocks (3.6Mb).

VAX Message Router Base V3.1 SPD 26.33

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 18,000 blocks (9,216 Kb). **Operation:** 10,000 blocks (5,120 Kb). This product is bundled in ALL-IN-1.

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-732A9-J	MEDIA	QA-732AA-H
DOCS	QA-732AA-GZ		

NEW VERSIONS

Excluding VAX Message Router Programming

VAX Message Router Programming V3.1 — SPD 26.33

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX Message Router Base.
Installation: 2,000 blocks (1,024Kb). **Operation:** 1,000 blocks (512Kb).

TK50 **5** Tape **M**	
MEDIA	

LICENCE	**QL-733A9-J**	MEDIA	**QA-733AA-H**
DOCS	**QA-733AA-GZ**		

VAX Message Router VMSmail Gateway V3.1B — SPD 26.33

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX Message Router Base.
Installation: 10,000 blocks (5,120Kb). Operation: 2,000 blocks (1,024Kb).
This product is bundled in ALL-IN-1.

TK50 **5** Tape **M**	
MEDIA	

LICENCE	**QL-730A9-J**	MEDIA	**QA-730AA-H**
DOCS	**QA-730AA-GZ**		

VAX Message Router/P (PROFS) V1.1B — SPD 28.94

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, DECnet/SNA Gateway on the DECnet/OSI WAN. **Installation:** 4,950 blocks (2535Kb). **Operation:** 2,520 blocks (1291Kb). Disk space required for the bundled Message Router V3.1 component: 5,000 blocks (2560Kb).

TK50 **5** Tape **M**	
MEDIA	

LICENCE	**QL-VCGA** **-AA**	MEDIA	**QA-VCGAA-H**
DOCS	**QA-VCGAA-GZ**		

VAX Message Router/S (SNADS) V1.1B — SPD 29.24

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA connection somewhere on the DECnet/OSI WAN. **Installation:** 4,380 blocks (2243Kb). **Operation:** 2,186 blocks (1120Kb). Disk space required for the bundled Message Router V3.1 component: 5,000 blocks (2560K bytes).

TK50 **5** Tape **M**	
MEDIA	

LICENCE	**QL-VDUA9-J**	MEDIA	**QA-VDUAA-H**
DOCS	**QA-VDUAA-GZ**		

VAX Message Router/X (X.400) V2.1B — SPD 27.50

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, with VAX P.S.I., VAX P.S.I. Access or alternative connection to the X.25 Packet Switch Network. **Installation:** 25,000 blocks (12.8 Mb). **Operation:** 17,000 blocks (8.704Mb).

TK50 **5** Tape **M**	
MEDIA	

LICENCE	**QL-VDMA9-J**	MEDIA	**QA-VDMAA-H**
DOCS	**QA-VDMAA-GZ**		

ULTRIX Mail Connection V1.1A — SPD 29.05

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

TK50 **5** Tape **M**	
MEDIA	

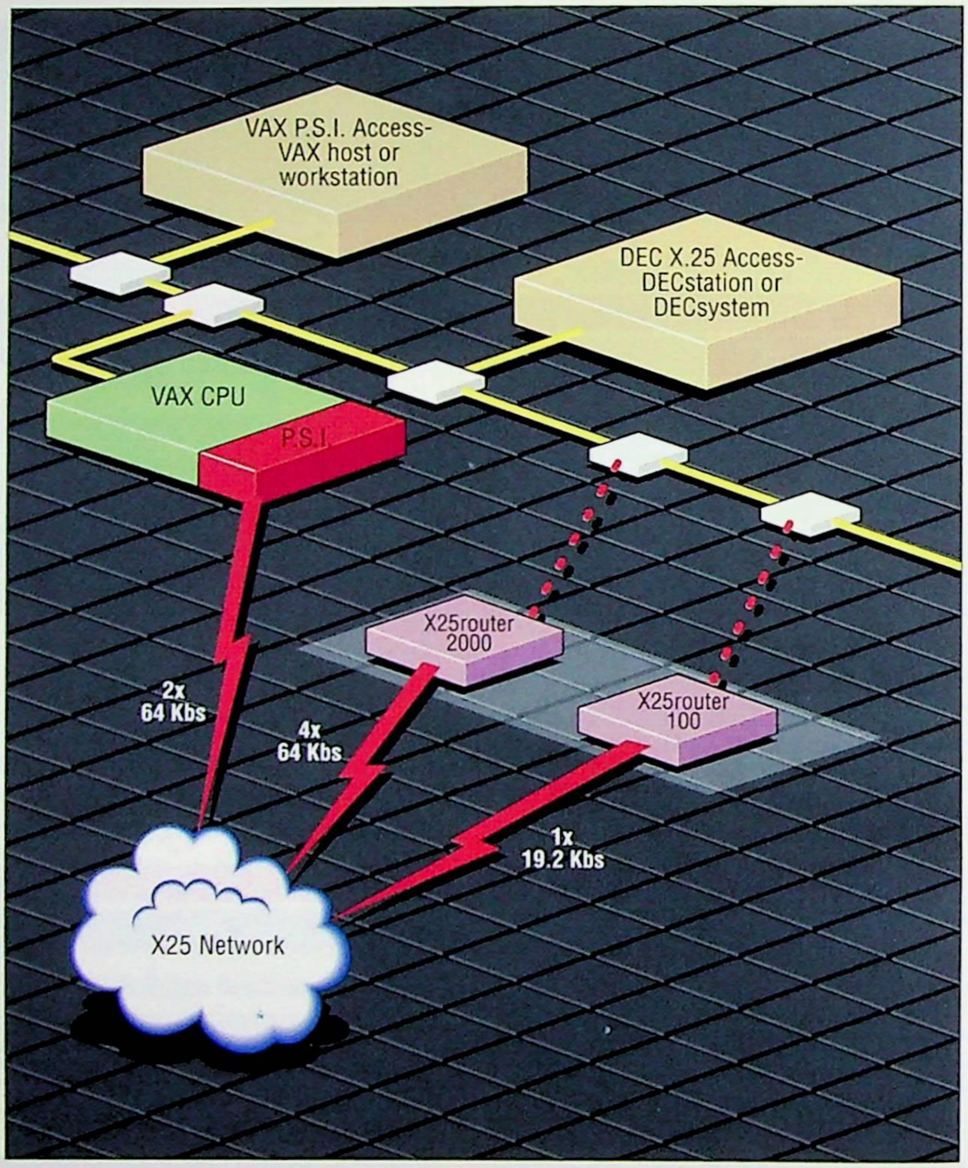
LICENCE	**QL-VFGA** **-AA**	MEDIA	**QA-VFGAA-H**
DOCS	**QA-VFGAA-GZ**		

Required Software: VAX ULTRIX Operating System or ULTRIX Worksystem Software, DECnet-ULTRIX, with Message Router Base on the VMS side of the fence. ULTRIX Mail Connection requires a minimum of 10,000 blocks (5Mb) disk space allocated permanently.

X.25-Based Services

PACKET SWITCHED NETWORK CONNECTORS

Traditionally, most data networks have made use of leased lines to connect geographically dispersed host computers. While this is cost-effective for a large amount of network traffic, there are many situations where this approach is inflexible or too expensive; often, you may have a desire to communicate with specified machines on an irregular basis, or with quantities of traffic that do not justify the cost of such a point-to-point connection. There is also a common need to communicate with other enterprises which are not part of your organisation.



The Connection

Public Packet Switched Data Networks (PSDNs) are the computer's analogy to the telephone. Once connected to a PSDN, calls can connect to any other number on that network, or on another PSDN that is cross-connected to it (usually for international data communication). Calls can be normally or reverse-charged, and the customer pays a tariff related to time of day, number called, and the duration and amount of data. The tariff structures vary considerably between public PSDNs, but the data charges are generally more significant than the time or distance factors.

The P.S.I. Link

Digital's Packet Switch Interconnect (P.S.I.) Products allow suitably configured Digital systems to connect to packet-switched data networks that conform to the CCITT Recommendation X.25. (CCITT is the International Telephone and Telegraph Consultative Committee, an advisory committee established under the United Nations to recommend worldwide standards.) VAX P.S.I. also supports International Standards 7776 and 8208, which standardise the protocols described in the CCITT recommendations.

X.25 Compatibilities

X.25 networking is now well established worldwide for the interconnection of computer systems and terminals. It provides network users and operators with an effective way of providing multi-vendor and multi-country information transfer. Digital's range of products provide X.25 network connections which allow local and remote connection of PCs, workstations or large clusters to communicate transparently over an X.25 network.

Because many networks contain non-Digital systems, Digital fully supports the concept of co-operative computing. When X.25 is used as the data link protocol between Digital and non-Digital systems, all upper-level protocols (such as file transfer protocols) must be written by the user, or purchased separately. Digital sells a variety of products that achieve such multi-vendor communication, as shown overleaf.

Connecting to the Packet Switch Network

Connection to a Packet Switch Data Network is either through a VAX running VAX P.S.I. software (with an appropriate synchronous communications interface), or via an X25router. An X25router provides a dedicated X.25 access service for any DECnet host machine connected to an Ethernet — and beyond. Details of the appropriate hardware options can be found in the DECdirect Hardware Catalogue.

Once a connection has been made, other computers on the DECnet network can connect to the X.25 service using VAX P.S.I. Access. Communications software on each DECnet host can then operate as if the X.25 network were connected locally.

Digital's P.S.I. products allow terminal communications according to CCITT recommendations X.3, X.28 and X.29. Remote terminals may access the VAX, and

X25router VMS Load Software V1.1	SPD 28.86
LICENCE	Included in X25router hardware
MEDIA	**QA-VIAAA-H5/HM**

Required Software: VMS Operating System. **Installation:** 2,700 blocks (1382 Kb) with trace, or 2000 blocks (1024 Kb) without. **Operation:** 7,700 blocks (3942 Kb) with trace, 7000 blocks (3584 Kb) without.

X25portal 2000 Load Software V1.1	SPD 25.F9
LICENCE	Included in X25portal hardware
MEDIA	**QA-VUHAA-H5/HM**

Required Software: VMS Operating System. **Installation:** 2,800 blocks (1.4Mb) without trace, 3,800 blocks (1.9Mb) with. **Operation:** 7,800 blocks (3.9Mb) without trace, and 8,800 blocks (4.5 Mb) with.

NEW VERSION 2.0

DEC X25 Access for ULTRIX/RISC

local terminals on the VAX may access remote computers. Extensive accounting, network management and security features are provided to allow the network manager to exercise appropriate control of X.25 services.

X25portals

Another connection method is the X25portal 2000 box, which sits on an Ethernet Local Area Network. However, the main purpose of this device is to enable the use of an existing DECnet communications backbone for carrying X.25 traffic. For people with an existing investment in cable plant used by DECnet, this product allows the X.25 traffic to be carried between different points on the existing wide-area network.

Building on your X.25 Investment

One of the most common uses of X.25 — in Digital customer sites — is to carry DECnet traffic. On release of DECnet/OSI Phase V later this year, DECnet will be able to use industry-standard Open Systems Interconnect protocols to communicate with other Digital (and other manufacturers') computers both inside and outside your enterprise. Products such as the DECrouter 2000 software will also be enhanced to support OSI protocols in line with this direction.

Available for immediate use

Besides use of DECnet today and in the future, there are a variety of other products that can build on your X.25 connection investment today. These are:

- Message Router X.400 Gateway — for electronic mail and document interchange between a Message Router based DECnet network and any other X.400 compliant message handling service. See the Communications section for further details.
- VAX/EDI — for the exchange of trading information between software applications in different enterprises via the INS TRADANET value added network service. See Information Management section for further details.
- Coloured Books (and Red Book) Services — to communicate with a wide range of other computer systems using data communications protocols defined by the Science and Engineering Research Council Joint Network Team.
- VAX OSI Applications Kernel (OSAK) — interfaces to the Session and Transport layers of the Open Systems Interconnect Protocols, to facilitate development of OSI-based applications.
- VAX FTAM — Provides File Access, Transfer and related services between systems that use the Open Systems Interconnect ISO 8571 FTAM standard.

The current OSI products from Digital enable users to benefit from OSI based communications today, with the smoothest possible transition to DECnet/OSI Phase V products in the future.

DEC X.25 Access for ULTRIX

The X.25 Access for ULTRIX provides X.25 connectivity for ULTRIX V3.x systems using an X25router 100 or X25router 2000; it also permits access via a VMS machine running VAX P.S.I. Multihost software.

ULTRIX/RISC, VAX ULTRIX and other locally connected UNIX systems can now inter-operate with remote systems from other vendors who've implemented TCP/IP over X.25. As such, standard Internet protocols such as FTP (Bidirectional File Transfer), Telnet (Remote Logins) and SMTP (for mail exchange) are all supported. DEC X.25 Access also provides programmers with the existing BSD 'Socket' Interface for program-to-program communication using TCP/IP or UDP/IP over X.25 PSDN's.

Digital plans to offer a direct programming interface to X.25, X.29 remote terminal connections and OSI protocol support (X.400 and FTAM) in future releases of this product.

X25router ULTRIX Load Software V1.1 SPD 29.86

LICENCE	Included in X25router hardware
MEDIA	**QA-VIAAB-H5/HM**

Required Software: ULTRIX V3.0. **Installation:** 2,100 blocks (1075 Kb) with trace, 3100 blocks (1587 Kb) without. **Operation:** 7,100 blocks (3635 Kb) with trace, 8100 blocks (4147 Kb) without.

VAX P.S.I. V4.3 SPD 25.40

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

TK50 **5**	Tape **M**
MEDIA	

LICENCE	**QL-071A9-J**	MEDIA	**QA-071AA-H**
DOCS	**QA-071AA-GZ**		

Required Software: VMS Operating System, VAX W.A.N. Device Drivers Kit to support prerequisite communications hardware. **Installation:** 4,500 blocks (2.3Mb). **Operation:** 3,100 blocks (1.6Mb).

VAX P.S.I. Access V4.3 SPD 27.78

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

TK50 **5**	Tape **M**
MEDIA	

LICENCE	**QL-061A9-J**	MEDIA	**QA-061AA-H**
DOCS	**QA-061AA-GZ**		

Required Software: VMS Operating System, VAX P.S.I. somewhere on the DECnet WAN. **Installation:** 4,000 blocks (2.0Mb). **Operation:** 2,500 blocks (1.3Mb).

DEC X25 Access for ULTRIX/RISC V2.0 SPD 26.E6

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

TK50 **5**	Tape **M**
MEDIA	

LICENCE	**QL-YP3E -AA**	MEDIA	**QA-YP3EB-H**
DOCS	**QA-YP3EA-GZ**		

Required Software: ULTRIX V3.0 **Required Hardware:** X.25 router 100 or X25 2000 for PSDN connection.

OSI-Based Services

TRUE VENDOR-INDEPENDENT COMMUNICATIONS—TODAY!

Exchanging information between computers of different brands and architectures is a commonplace requirement in today's business environment. To help achieve an efficient long-term solution to this requirement, the Open Systems Interconnect (OSI) model and standards have been and are being developed under the umbrella of the International Standards Organisation (ISO).

For use with VAX computers running VMS and DECnet-VAX, Digital has developed several OSI service products to run over DECnet local and wide area networks. The benefits of using OSI based services for networked information exchange are:-

- Application stability
- Single, multi-vendor solution
- Easier systems integration
- Lower operational costs

Migration to full OSI

Digital's migration to OSI is mapped out in the published plans for DECnet/OSI Phase 5 — Digital's public commitment to standards-based networking. The current OSI products enable users to adopt OSI early and migrate to full OSI with the smoothest transition possible. For further details, please call us for our DECnet/OSI Phase V Transition brochure, part no: EX-PVTRN-BR.

VAX FTAM

FILE TRANSFER, ACCESS AND MANAGEMENT

Information is the life-blood of a business. Much of it is locked away in computer files — typically on many different systems throughout an organisation.

Digital's VAX FTAM provides multi-vendor File Transfer, Access and Management based on agreed international, vendor-independent standards. It provides the ability to transfer and access files with other computer systems which provide ISO 8571 FTAM complaint services. VAX FTAM is compliant with the Government OSI Profile (U.K. GOSIP 1988).

VAX FTAM supports the transfer of FTAM 1 (unstructured, stream record ASCII files), FTAM 2 (variable length record sequential files with carriage-return attributes) and FTAM 3 (unstructured stream files containing binary data) document types.

VAX FTAM possesses Digital Command Language (DCL) level user commands, supports any file naming convention, and comes with a variety of system management tools.

VAX OSAK

OSI TOOLKIT FOR SOFTWARE DEVELOPERS

VAX OSI Applications Kernel is a layered product on VMS V5.0 that provides application developers with an OSI-conformant base on which to develop products. The product consists of interfaces to the Session and Transport layers of the Open Systems Interconnection (OSI) Basic reference model for communications. A full range of example programs, debugging and tracing tools form an integral part of the product.

VAX OSI Application Kernel is designed for OEMs, software houses and major customers with their own internal development facilities, who wish to develop OSI-conformant applications today, with the ability to migrate seamlessly in the future to DECnet/OSI Phase V.

VAX Message Router X.400 Gateway

For many enterprises, the exchange of messages in the form of both electronic mail or documents is a great asset. X.400 provides a standards based message handling service that operates between any system that supports CCITT 1984 X.400 Recommendations.

The VAX Message Router X.400 Gateway Product provides a path between a VAX Message Router based network (including its gateways to various proprietary mail interchange products), and other X.400 compliant systems connected to a public packet switched data network. See the MAILbus article for further details.

Bringing it all together

We have found that many customers using larger VAX processors purchase all three OSI products—Message Router X.400 Gateway, VAX FTAM and VAX OSAK—together. For this reason, we have created a special package of all three products, and a reduced price. The VAX OSI Applications Package consists of all the licences and media kits (on 1600bpi Magtape) orderable as a single part number. See the Priced Index for further details.

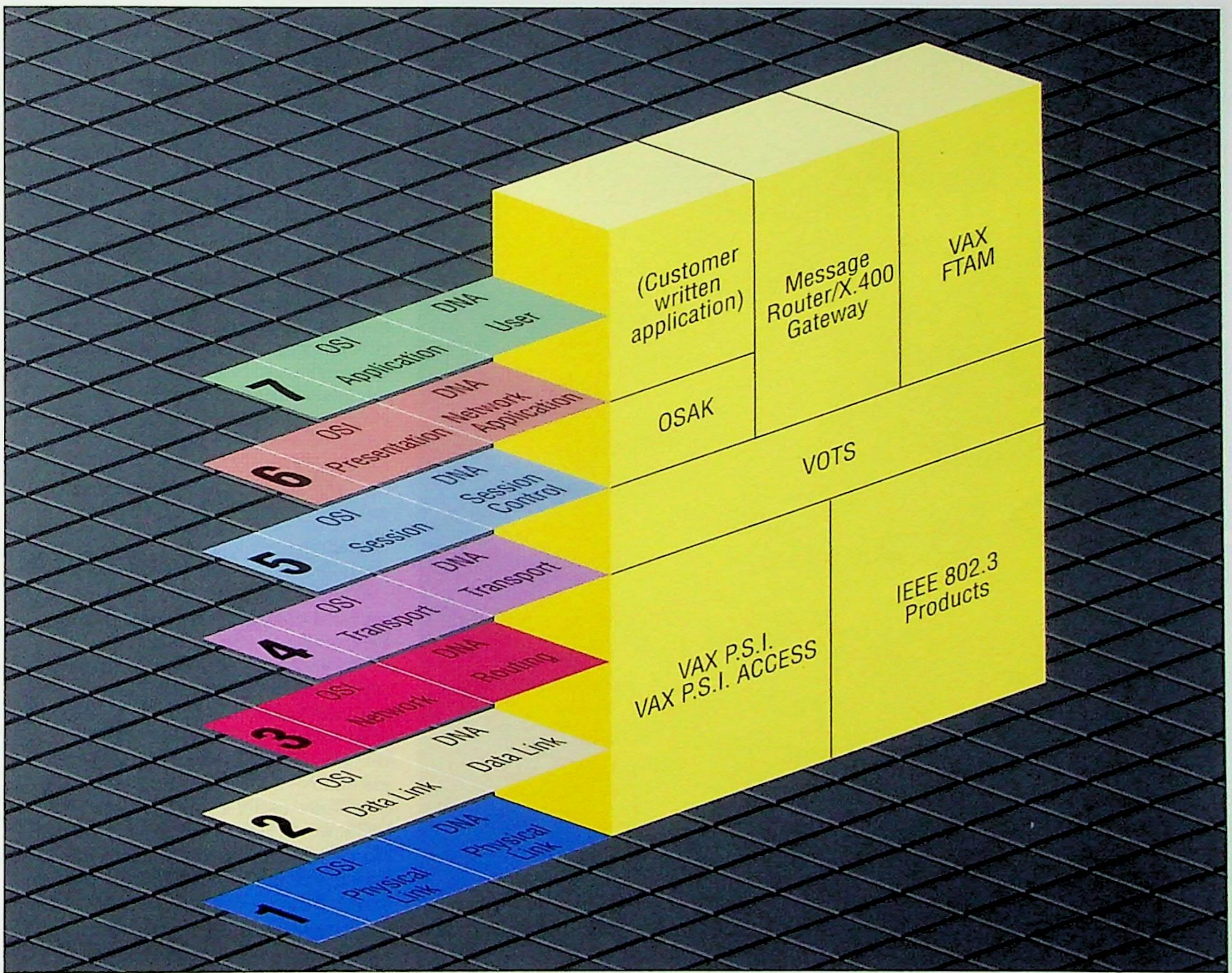
Software prerequisites, disk space used and service entitlements remain the same as the sum of the individual products. All the individual products remain on sale separately.

Digital has successfully inter-operated with OSI software from the following companies:

Producer	FTAM	X.400
AT&T		✔
British Telecom		✔
Datacraft		✔
Data General		✔
Honeywell Bull	✔	✔
Hewlett Packard		✔
HTC		✔
Fujitsu		✔
IBM		✔
ICL	✔	✔
NCR	✔	✔
NET-TEL	✔	
Nixdorf		✔
Olivetti		✔
OTC		✔
Philips		✔
Prime		✔
Rank Xerox		✔
Retix	✔	✔
Scicon		✔
Sema Group		✔
Siemens		✔
Sun	✔	✔
Telecom		✔
Telenet		✔
Unisys	✔	✔
Wang		✔

Note that some of these may still be in field test, and not currently shipping.

NEW VERSION 1.1A



OSI is based on an architectural model that defines a layered protocol structure for systems communications.

VAX FTAM OSI File Transfer V1.1A SPD 29.86

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, VAX P.S.I., VAX P.S.I. Access or alternative X.25 connection. **Installation** (of FTAM): 3,000 blocks (1536 Kb). **Installation** (of bundled VOTS): 3,000 blocks (1536 Kb), giving a grand total of 6,000 blocks (3072 Kb). **Operation** (of FTAM): 2,000 blocks (1024 Kb). **Operation** (of bundled VOTS): 3,000 blocks (1536 Kb), giving a grand total of 5,000 blocks (2560 Kb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VFWA** ☐ **-AA**	MEDIA	**QA-VFWAA-H** ☐
DOCS	**QA-VFWAA-GZ**		

VAX OSAK V1.1A SPD 27.47

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX P.S.I., VAX P.S.I. Access or alternative X.25 connection. **Installation:** 4,000 blocks (1.1Mb). **Operation:** 4,000 blocks (1.1Mb).

	TK50 **5**	Tape **M**
MEDIA		

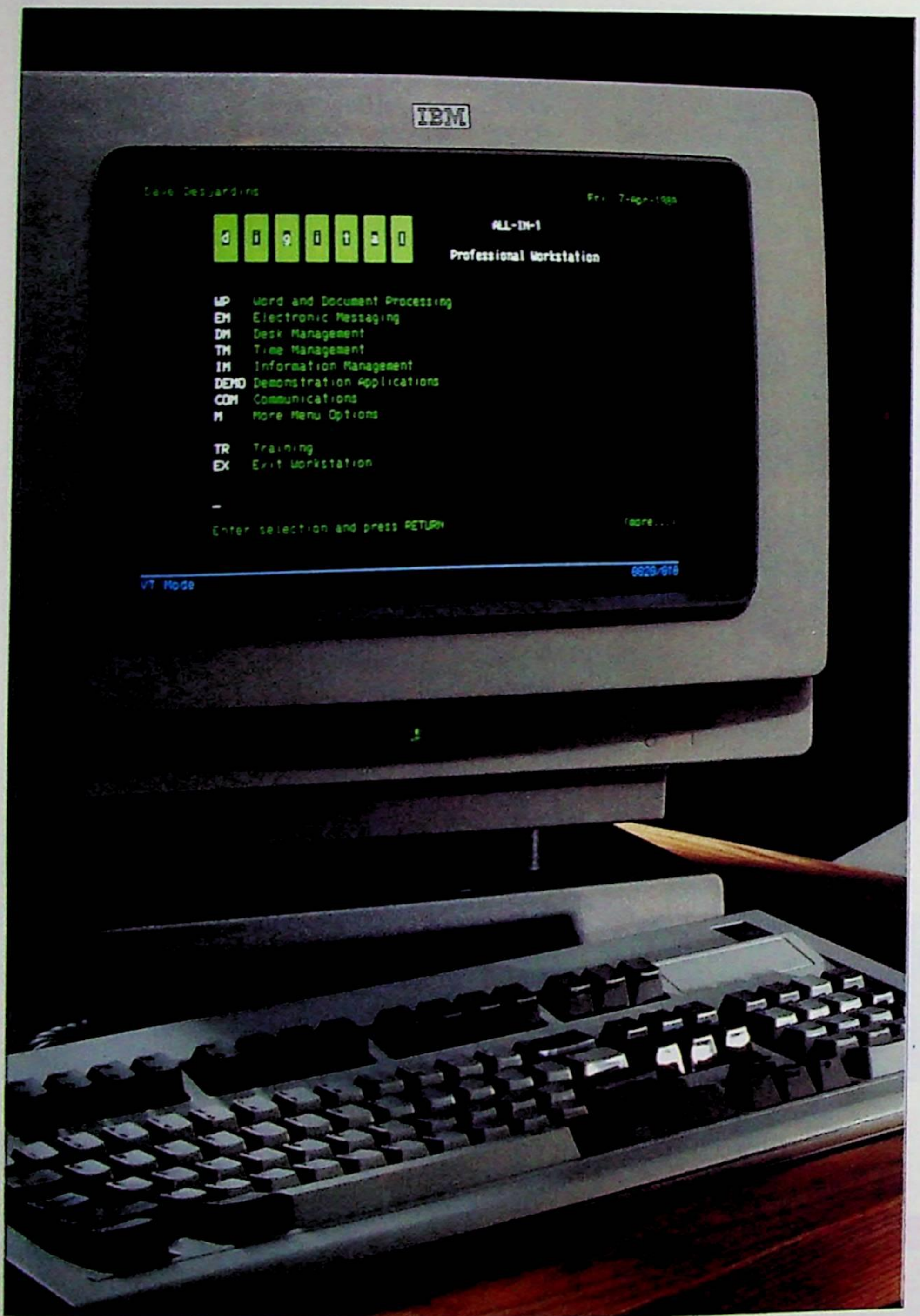
LICENCE	**QL-VD9A9-J** ☐	MEDIA	**QA-VD9AA-H** ☐
DOCS	**QA-VD9AA-GZ**		

IBM host communications

NEW VERSION 2.1

MAKING THE CONNECTION

DECnet/SNA Gateway-ST/CT Gtwy. Mgmt.



IBM terminal connected to ALL-IN-1 via Ethernet, using the DECserver 550 CXMO4 card. See VMS Printer and Terminal Connections in the Base Systems section.

In today's business environment, we are surrounded by an ever-increasing amount of information — and the need to move it effectively to wherever it is needed. Ideally, this should be done in a way which is simple and transparent to the users of the information, so that they can concentrate on the task in hand. The inability to generate, distribute and share information within an enterprise is often a strategic weakness.

A significant proportion of Digital's customers have investments in IBM mainframe technology, and could benefit from the integration of the two computing environments. Over several years, Digital has developed a broad set of products to integrate with the IBM S/370 mainframe environment. Our aim has always been to provide bi-directional, transparent information flow between the Digital and the IBM worlds, allowing an enterprise to capitalise on the strengths of both.

Digital first introduced an emulator to interface with an IBM SNA network in 1980. Our first DECnet-to-SNA gateway appeared in 1983. We were the first non-IBM vendor to offer a capability to link into IBM DISOSS and also to offer an LU-6.2 programming interface. In 1987, we introduced software to enable IBM datasets to be accessed as if they were Digital files; this software actually resided on the IBM mainframe. Now with our latest generation of DECnet-to-SNA gateways, announced in 1988, we are able to link a variety of Digital systems into the IBM S/370 world (MVS, VM and DOS/VSE based systems) to offer a blend of performance and functionality that is second to none.

Our approach has always been to provide a choice of connectivity options and a range of applications that can be used in conjunction with those options. This article discusses the types of connection, and also the applications themselves, in some detail.

DECnet /SNA Gateway-ST V1.1	SPD 25.C6
LICENCE	Included in SNA Gtwy. DEMSA hardware
MEDIA	**QA-S01AA-H5** (TK50)
	or **QA-S01AA-HM** (Tape)

Required Software: VMS Operating System. **Installation:** 2,000 blocks (1,000 Kb). **Operation:** 1,800 blocks (900 Kb).

DECnet /SNA Gateway-CT V2.0	SPD 29.78
LICENCE	Included in CT hardware
MEDIA	**QA-VC9AA-H5** (TK50)
	or **QA-VC9AA-HM** (Tape)

Required Software: VMS Operating System. **Installation:** 1400 blocks (700 Kb). **Operation:** 1200 blocks (600 Kb).

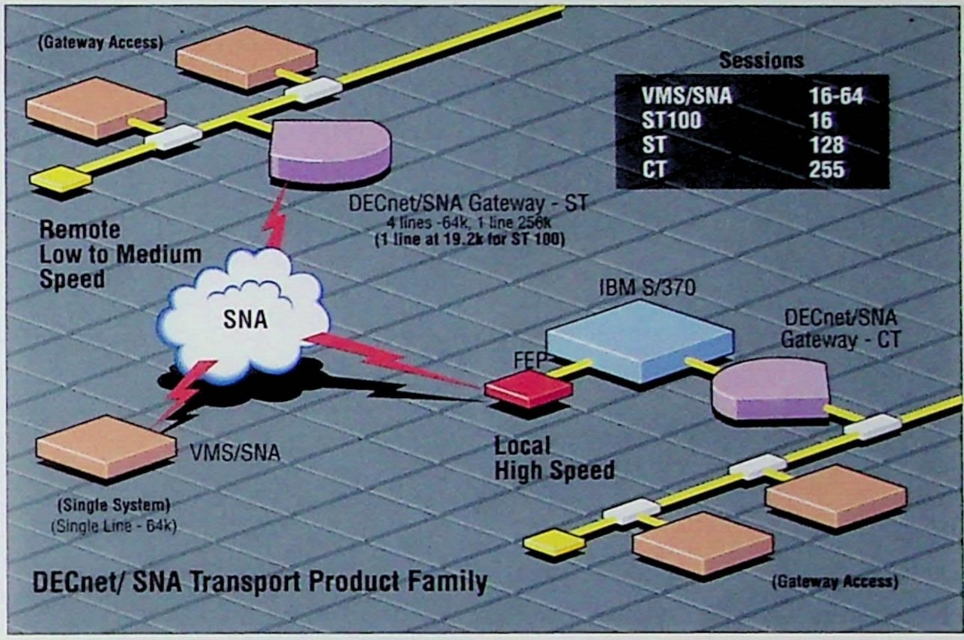
DECnet /SNA ST/CT Gtwy. Mgmt. V2.1	SPD 29.70
LICENCE	Included in hardware
MEDIA	**QA-VCKAA-H5** (TK50)
	or **QA-VCKAA-HM** (Tape)

Required Software: VMS Operating System, DECnet/SNA Gateway-ST or DECnet-SNA Gateway-CT. **Installation:** 1700 blocks (850 Kb). **Operation:** 1500 blocks (750 Kb).

TRANSPORT PRODUCTS: CHOOSING THE RIGHT CONNECTION.

It is important to look at the connectivity considerations that are independent of the actual application involved. For example, where are the systems located? How many users wish to make use of the facility? What overall throughputs need to be achieved ? These are questions that need to be addressed by Digital's choice of connectivity products. Because these products are responsible for the transport of application information, we refer to these as the transport product family.

There are three products to choose from, and each has its own characteristics. Whichever product or combination of products you choose, you still retain flexibility in your choice of appropriate 'access' software products.



Key features of Digital's Transport Product Family		
VMS/SNA	DECnet/SNA Gateway for Synchronous Transport (ST)	DECnet/SNA Gateway for Channel Transport (CT)
Software	Hardware and Software Gateway	Hardware and Software Gateway
Single System	Multiple System Connection	Multiple System Connection
16-64 active sessions	128 active sessions(3)	255 active sessions
Remote	Remote	Local Only
1 physical line(2) at speeds to 64kbps	1-4 physical lines at speeds to 256kbps(3)	1 Channel interface byte or Block MUX or Selector
VAX VMS access only(1)	VMS, ULTRIX and MS-DOS access	VMS, ULTRIX and MS-DOS access

(1) DHCF access is not supported with VMS/SNA (2) X.25 circuit supported as alternative to SDLC link
(3) One line at a speed of up to 19.2kbps with 16 sessions using the single-line DECnet/SNA Gateway-ST100.

ACCESS PRODUCTS: CHOOSING THE RIGHT APPLICATION.

Independent of your choice of connectivity option, a range of capabilities is available for exchanging information between Digital and IBM user communities. Digital provides a range of access software products which use the transport products to deliver specific functional capabilities. The access software products can be used in any combination on any number of systems within the Digital DECnet environment to meet requirements anywhere in the enterprise.

These access capabilities can be split into four functional areas, each of which consists of a portfolio of products:

CAPABILITY 1: INTERACTIVE ACCESS.

Objective: To allow for interactive access between the Digital and IBM communities, enabling Digital users to access IBM applications and vice versa. This is independent of the type of workstation that the users may have adopted for the bulk of their working activity. The most common application here is terminal emulation.

CAPABILITY 2: BUSINESS COMMUNICATIONS.

Objective: To allow for the exchange of electronic mail and documents between messaging services in the Digital and IBM environments. This is a specific case of Information Exchange.

CAPABILITY 3: INFORMATION EXCHANGE.

Objective: To allow for the exchange of, and access to, information that may be resident in the other environment. By allowing access to information, it is possible to promote the idea of a single source of information being disseminated to a multi-vendor population, avoiding the associated problems inherent in creating multiple copies.

CAPABILITY 4: APPLICATION INTERFACES.

Objective: To meet the requirement for customised multi-vendor applications designed specifically to meet the needs of a particular situation. It will be the application designer, rather than the end user, who will take advantage of these capabilities.

So, whether you are looking for simple terminal emulation or a complex distributed database application, Digital can offer the capability to match your needs — independent of your choice of connectivity option.

VMS/SNA V2.0																SPD 27.01					
TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, VAX WAN Device Drivers Kit. VAX P.S.I or VAX P.S.I. is required for QLLC connections over X.25 to an IBM 37xx Communications Controller running NCP-NPSI. **Installation:** 3300 blocks (1.6896M bytes). **Operation:** 2300 blocks (1.1776M bytes).

TK50 **5** Tape **M**
MEDIA

LICENCE	**QL-362A** ☐ **-AA**	MEDIA	**QA-362AA-H** ☐
DOCS	**QA-362AA-GZ**		

IBM host communications *(continued)*

NEW VERSION 1.1

DECnet/SNA ULTRIX/RISC 3270 Terminal Emulator

Interactive Access

Today, with one desktop device, a user can interactively access applications residing in different environments and systems. The choice of desktop workstation is determined by the specific requirements of individual users, but hardware choice does not limit their ability to communicate.

The table here shows the capabilities offered by these products: the name of the product which delivers the solution and the key area of functionality.

Capabilities of Digital access software

Capability	Solution	Features
Digital VT terminal access to IBM application	3270 Terminal Emulator for VMS application and ULTRIX	Allows VT terminal to emulate monochrome text 3270 device
IBM 3270 access to LOCAL Digital application	CXM04 option for DECserver 550 terminal server	Allows IBM 3270 device to emulate monochrome VT terminal
IBM 3270 access to REMOTE Digital application	Distributed Host Command Facility (DHCF)	Allows IBM 3270 device simple command level access to VAX
IBM PC access to Digital application	VAX Services for DOS and DECnet/PCSA PC Client	Allows PC to emulate a monochrome VT terminal over a DECnet WAN
IBM PC access to IBM application	MS-DOS 3270 Terminal Emulator plus DECnet/PCSA PC Client	Allows PC to emulate a colour text 3270 device
Job submission from Digital VAX to IBM mainframe	Remote Job Entry (RJE)	Job entry and simple file transfer to IBM host
Print Job from IBM mainframe on Digital printer	Printer Emulator	Allows print output to be directed to VAX printer
Digital Workstation access to IBM application	DECwindows 3270 Terminal Emulator	Provides 3270 emulation for colour and graphics

DECnet/SNA VMS 3270 Terminal Emulator V1.5 — SPD 26.84

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA. **Installation:** 450 blocks (225 Kb). **Operation:** 300 blocks (150 Kb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-454A9-J	MEDIA	QA-454AA-H
DOCS	QA-454AA-GZ		

DECnet/SNA ULTRIX/RISC 3270 Terminal Emulator V1.1 — SPD 29.88

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-VCWA -AA	MEDIA	QA-VCWAA-H
DOCS	QA-VCWAA-GZ		

Required Software: ULTRIX-32 V2.2 or later, or ULTRIX Worksystem Software, DECnet-ULTRIX. A DECnet/SNA gateway with appropiate VMS load host software. **Installation:** 683 blocks (350Kb) **Operation:** 683 blocks (350Kb).

DECnet/SNA Print Emulator V1.2 — SPD 26.70

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection. **Installation:** 450 blocks (0.2304Mb). **Operation:** 400 blocks (0.2048Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-044A9-J	MEDIA	QA-044AA-H
DOCS	QA-044AA-GZ		

DECnet/SNA VMS RJE V1.4 — SPD 26.85

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection. **Installation:** 2,200 blocks (1.1264Mb). **Operation:** 1,000 blocks (0.512Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-453A9-J	MEDIA	QA-453AA-H
DOCS	QA-453AA-GZ		

DECwindows 3270 Terminal Emulators

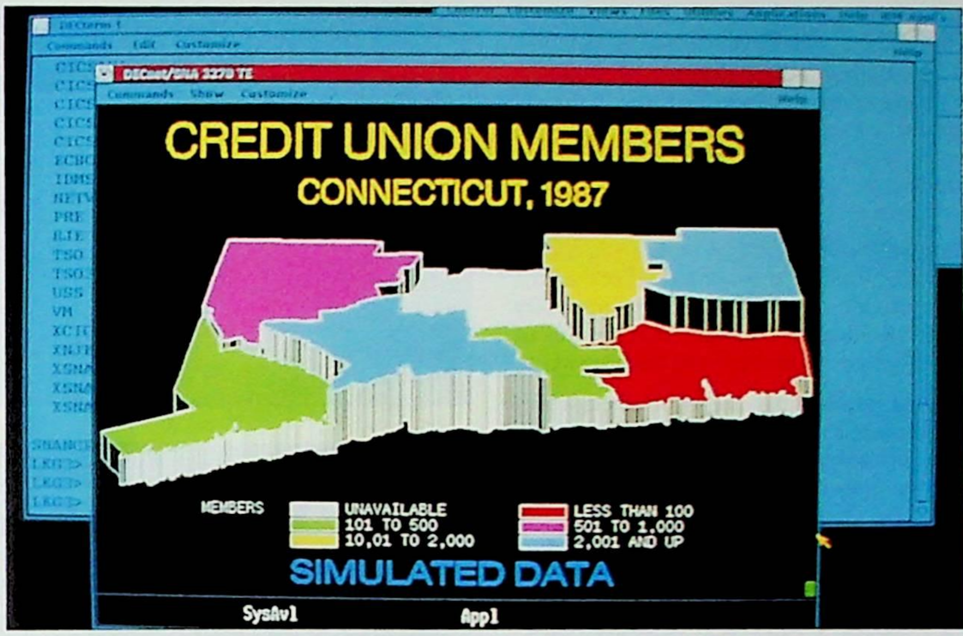
The DECwindows 3270 Terminal Emulators are graphical software products that allow workstation users in a DECnet environment to interactively access IBM mainframe-based applications via a supported DECnet/SNA gateway. VMS, VAX ULTRIX and ULTRIX/RISC versions are now available.
The DECwindows 3270 terminal emulators provide similar functions to those available to the user of IBM 3178, 3180, 3278, 3179-G, 3192-G or 3279-S3G display stations. These include:

- Extended colour and highlighting attributes, plus Programmed symbols/character set
- Mouse support
- All Points Addressable (Vector-to-Raster) Graphics
- Monochrome Graphics Hardcopy
- Integrated with other DECwindows functions

The VMS version is be available as part of the Consolidated Distribution CD and has its documentation available on the Consolidated Documentation Disk.

Graphics Support for 3270TE for MS-DOS
The MS-DOS 3270 Terminal Emulator layers on DECnet/PCSA Client for PCs to allow an MS-DOS Personal Computer to interactively access IBM mainframe-based applications.

The V2.0 release has three modes of operation: 3192G (all points addressable), 3279 S3G (Program Symbol Graphics) in addition to the original 3278 model 2 emulation (text only). Extended Attribute Support (underscored text, extended colour and reverse video), Mouse and Graphics printing capabilities are also present. Access to IBM Mainframe applications is gained via a DECnet/SNA Gateway.



With DECwindows DECnet/SNA 3270 Terminal Emulators, users of VMS or ULTRIX workstations on DECnet have a graphic interface to IBM mainframe-based graphic applications.

DECnet/SNA MS-DOS 3270 TE V2.0	SPD 30.63
LICENCE	QL-VFAA9-AA
MEDIA on 3.5" 720Kb Disk	QA-VFAA9-HB
on 5.25" 360Kb Disk	QA-VFAA9-HI

Required Hardware: A DECnet/SNA Gateway somewhere on your DECnet network. Graphics modes require EGA (128Kb for 3279 emulation, or 256Kb for 3192) or VGA card. **Required Software:** PCSA Client Software.

DECwindows 3270TE for VMS V1.0																SPD 31.58
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Hardware: Any valid DECnet?SNA Gateway or VMS/SNA. DECwindows is also required. **Installation:** 2,600 blocks (1300Kb) **Operation:** 1,500 blocks (750Kb)

TK50 **5**	Tape **M**
MEDIA	

LICENCE	QL-VXBA9-J	MEDIA	QA-VXBAA-H
DOCS	QA-VXBAA-GZ		

DECwindows 3270TE for VAX ULTRIX V1.1																				SPD 31.57
VAX ULTRIX	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Hardware: Any valid DECnet/SNA Gateway connection via DECnet-ULTRIX. **Installation:** 10,817 blocks (539Kb) **Operation:** 10,817 blocks (539Kb)

TK50 **5**	Tape **M**
MEDIA	

LICENCE	QL-VXAA -AA	MEDIA	QA-VXAAA-H
DOCS	QA-VXAAA-GZ		

DECwindows 3270TE for ULTRIX/RISC V1.0								SPD 31.57
ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

TK50 **5**	Tape **M**
MEDIA	

LICENCE	QL-VXAA -AA	MEDIA	QA-VXAAB-H
DOCS	QA-VXAAB-GZ		

Required Hardware: Any valid DECnet/SNA Gateway connection via DECnet-ULTRIX. **Installation:** 10,817 blocks (539Kb) **Operation:** 10,817 blocks (539Kb).

NEW VERSION 2.0A

IBM host communications *(continued)*

Business Communications

Today, most organisations rely on the ability to move commonplace electronic materials around their user population. The ability to send electronic mail or do document transfer is one of the most common applications of networking.

However, with the reality of multi-vendor communications, it is not just sufficient to offer this ability within one user community. Both Digital and IBM users must be able to exchange electronic mail and documents.

Digital provides two major products which enable just such a facility to communicate with both the IBM PROFS and DISOSS user environment.

Information Exchange

Simply being able to access information is often not enough. Information in one environment may need to be manipulated from another. Files of information may be required to be transferred across the networks from system to system. Increasingly, the emphasis is moving towards the need for transparent, high speed, bi-directional movement of information between the Digital and the IBM worlds.

The precise requirement will largely depend on the user requirements and the nature of how the information is stored in the Digital and IBM environments. Just as there are different storage and access methods, there must also be a family of products capable of the access and transfer of this information among the systems of today.

Digital's Message Router options

Message Router to IBM SNADS	**Message Router to IBM PROFS**
Interfaces between Digital MAILbus and IBM SNA Distribution Services (SNADS).	Interfaces between Digital MAILbus and IBM PROFS and IBM CMS.
Address and Content conversion between Digital (e.g. ALL-IN-1) and IBM DISOSS.	Address and Content conversion between Digital (e.g. ALL-IN-1) and IBM PROFS.
Allows DISOSS users to communicate via the Digital network to other external services.	Allows PROFS users to communicate via the Digital network to other external services.
Delivery Notification supported.	Delivery Notification supported.

Information access and transfer products

File Access and Transfer	**Database Access and Transfer**	**Videotex Services**
Data Transfer Facility (DTF)	VAX to IBM Database Access (VIDA for IBM DB2™)	VTX - IBM terminal/host links
Allows Digital users and applications to access information resident on the IBM mainframe as if they were VAX files.	Digital users and applications can access an IBM DB2 database as if it were a Digital Rdb relational database.	Extends the facilities of Digital's VTX videotex product to enable users of IBM 3270 terminals access to VTX based information pages.
In addition both Digital and IBM users can transfer files in either direction between the systems. Support for IBM BSAM, QSAM and VSAM files is provided.		Also, enables a live link to be made via LU6.2 to a CICS transaction allowing display of real time data within a VTX information page.

MVS/DTF V2.0 SPD 27.85

LICENCE	QL-1GQA9-AA
MEDIA	QA-1GQAA-HA

Required Software: VMS Operating System. **Installation:** 1,600 blocks (819.2Kb). **Operation:** 700 blocks (358.4Kb).

DECnet/SNA DTF Server V2.0a SPD 27.85

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection, with DTF/MVS loaded on IBM host. **Installation:** 3,000 blocks (1,536Kb). **Operation:** 1,400 blocks (716.8Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-VEBA9-J	MEDIA	QA-VEBAA-H
DOCS	QA-VEBAA-GZ		

DECnet/SNA DTF Client V2.0a SPD 27.85

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection, with DTF/MVS loaded on IBM host and DECnet/SNA DTF Server loaded on a VAX somewhere on your DECnet/OSI WAN. **Installation:** 1,600 blocks (819.2Kb). **Operation:** 700 blocks (358.4Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-VEKA9-J	MEDIA	QA-VEKAA-H
DOCS	QA-VEKAA-GZ		

Application Interfaces

Application designers often require not just the functionality offered by the products highlighted so far, but also the ability to integrate the capabilities offered into their own applications. For such requirements, Digital offers a set of application programming interfaces which enable the application designer to integrate the Digital and IBM environments.

Since there is a choice of services you can use in an IBM SNA environment, there is also a choice of products for the different services provided.

Application Interface options

Application Programming Interface (API)	3270 Datastream Programming Interface (3270 DS)	Advanced Program to Program Communication (APPC/LU6.2)
Logical Unit Type 0	Logical Unit Type 2	Logical Unit Type 6.2
Programming facility for device dependent and complex applications.	Allows a VAX application to communicate with an IBM application as if it were an IBM 3270 device.	Allows a VAX and IBM application to have peer-to-peer type connection using simple program calls.

DECnet/SNA APPC/LU6.2 V2.1 — SPD 26.88

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection. **Installation:** 2,100 blocks (1,075.2Kb). **Operation:** 1,300 blocks (665.6Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-022A9-J**	MEDIA	**QA-022AA-H**
DOCS	**QA-022AA-GZ**		

DECnet/SNA 3270 Datastream V1.4 — SPD 26.87

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA. **Installation:** 1300 blocks (650 Kb). **Operation:** 1100 blocks (550 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-363A9-J**	MEDIA	**QA-363AA-H**
DOCS	**QA-363AA-GZ**		

DECnet/SNA VMS API V2.3 — SPD 26.86

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection. **Installation:** 4700 blocks (2.4Mb). **Operation:** 4600 blocks (2.3Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-455A9-J**	MEDIA	**QA-455AA-H**
DOCS	**QA-455AA-GZ**		

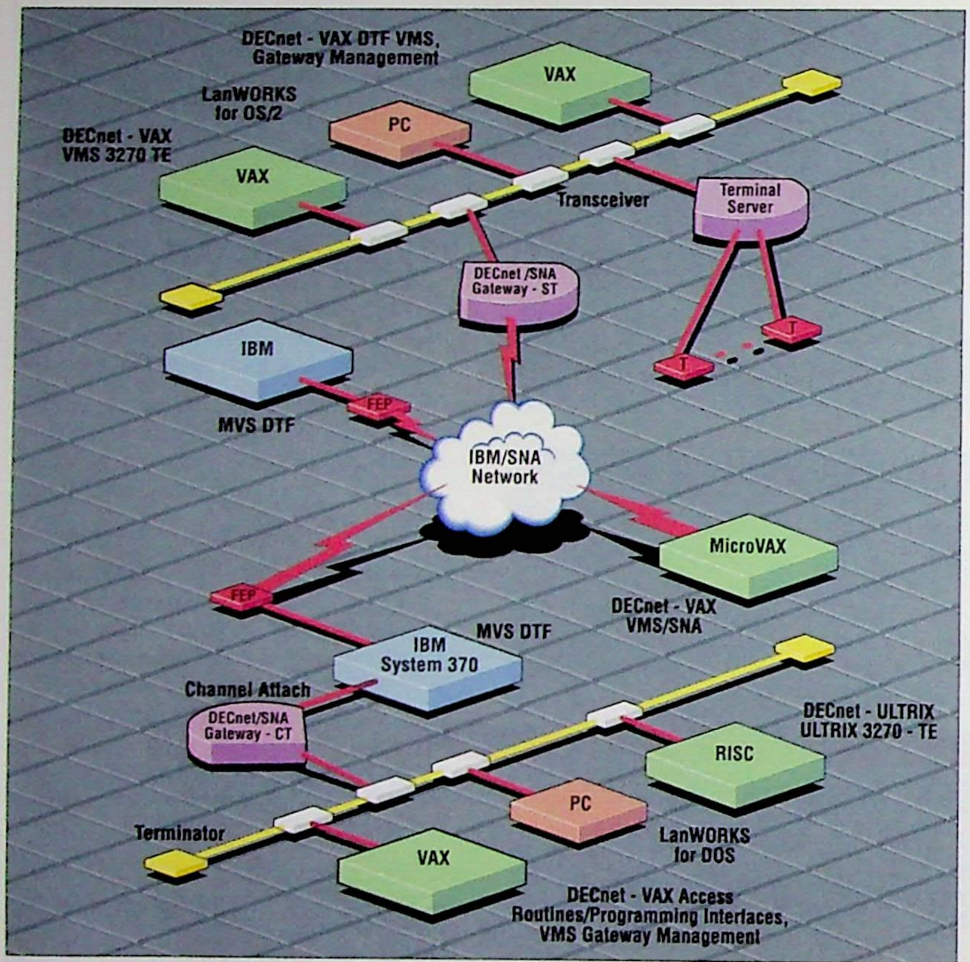
VAX 2780/3780 Protocol Emulator V1.7 — SPD 25.07

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX W.A.N. Device Drivers Kit. **Installation:** 650 blocks (325 Kb). **Operation:** 600 blocks (300 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-111A9-J**	MEDIA	**QA-111AA-H**
DOCS	**QA-111AA-GZ**		



Digital/IBM communications products range from single-function, point-to-point protocol emulation to multifunctional network-to-network communications via an IBM channel.

Digital-to-IBM Interconnect: The complete picture

We have looked at the roles of Connectivity and Capability which effectively link the differing worlds of Digital and IBM — the roads that we build between them and the types of traffic that use those roads. But in reality, there are still more elements involved in building up the complete picture.

Our offer in IBM Interconnect to the S/370 mainframe can be supplemented with our other integration capabilities. These offer a fully functional and manageable environment which links the various desktops within your enterprise to the many datacentres, all via the DECnet network.

Building from a simple starting point of a single VAX connected into a single mainframe system, you can build an evolving network link by link, preserving the investment made along the way. Investment made in both access software and people skills can migrate as your Connectivity requirements change. Also, investment made in the physical links between your Digital and IBM communities can be made even more productive by the addition of other Capabilities.

Linking Digital networked systems into your existing IBM environment allows your investment to be used in new, innovative ways. Digital's range of distributed hardware and software products are but part of the big picture.

DECnet/SNA DISOSS Document Exchange Facility (DDXF) V1.4 — SPD 26.72

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection. **Installation:** 3696 blocks (1893 Kb). **Operation:** 1306 blocks (669 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-042A9-J**	MEDIA	**QA-042AA-H**
DOCS	**QA-042AA-GZ**		

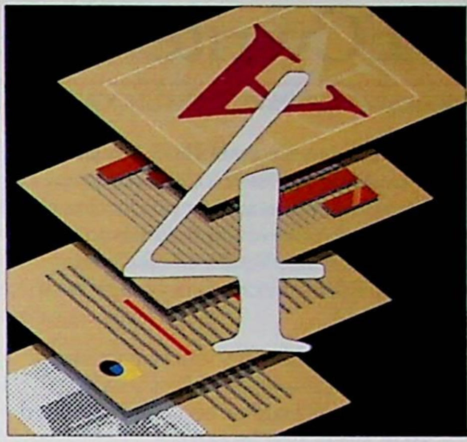
EDE with IBM DISOSS V2.1 — SPD 26.92

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet/SNA Gateway or VMS/SNA connection, plus DECnet/SNA DISOSS Document Exchange Facility (DDXF). **Installation:** 6300 blocks (3.2256Mb). **Operation:** 1350 blocks (0.6912Mb). Additional space required if used within ALL-IN-1: 215 blocks (.1101Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-761A9-J**	MEDIA	**QA-761AA-H**
DOCS	**QA-761AA-GZ**		



Office applications

A busy end user quickly realises that it is not the amount of processing power, memory or local storage that makes a terminal or workstation effective, but rather its ability to share and communicate information. Making this information-sharing possible across an enterprise is a major challenge for information system managers: it is also one of Digital's greatest strengths.

Digital's ALL-IN-1 software is the best selling integrated office information system in the world. It enables you to integrate your key applications with standard office, time-management and electronic mail facilities. ALL-IN-1 also integrates telex, X.400, UNIX mail and other vendors' office systems via optional MAILbus products.

Digital's office products are evolving to handle compound documents based on industry standards. Products such as DECwrite and DECdecision can combine text, tables, graphics and images into a single, revisable document. Both make extensive use of 'hot link' facilities to integrate information from different systems and hardware platforms throughout your organisation — and both are available now.

A full range of services is available to plan, install and tailor your Digital office products in line with the business needs of your enterprise — anywhere in the world.

See also:

DECwrite

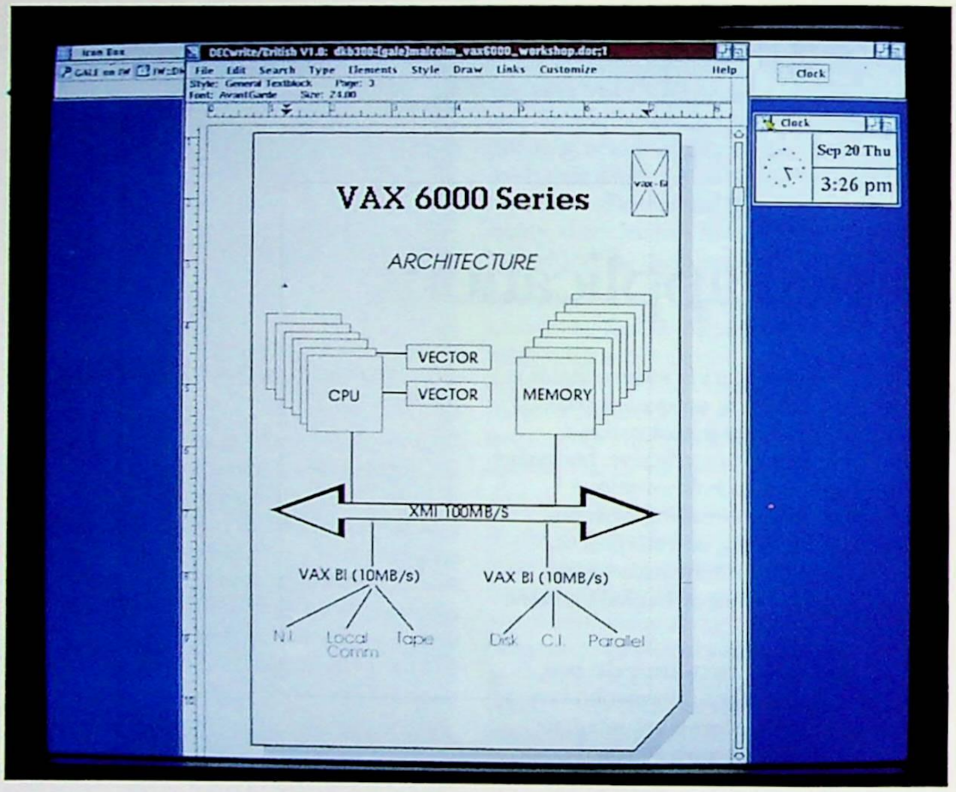
NEW PRODUCT

DIGITAL'S DO-EVERYTHING DOCUMENT EDITOR REWRITES THE BOOK

DECwrite for OS/2

DECwrite is a Digital's DECwindows-compliant WYSIWYG ('what you see is what you get') document production tool that makes full use of Digital's advanced bit-mapped VMS, VAX ULTRIX and ULTRIX/RISC workstations — and now, OS/2 as well!

- Selectable, familiar text processing commands — 'Gold Key', EDT, EMACS, WordPerfect and MS Word style keyboard layouts!
- Powerful stylesheet-controlled word processor, including spelling and language-usage checking, on-line electronic thesaurus, red-lining and change bars.
- Built-in graphics toolset allows diagrams and illustrations to be created within DECwrite itself.
- Scanned images can be incorporated and manipulated within DECwrite. UNIX implementations can also view Encapsulated PostScript images on-screen.
- Built-in business graphics capability automates the production and integration of charts using internal or external worksheets.
- LiveLink™ feature allows imported data to be automatically updated within documents.
- Built-in equation editor based on TeX.
- Ability to output documents in DECwindows VMS Bookreader format, which uses the table of contents, cross references and index of the document for online navigation.



DECwrite can have Livelink™ connections to a variety of other CDA compliant applications, so a document's numbers, text and graphics can be kept up-to-date with minimum effort.

Integrated word processor

DECwrite features all the capabilities you'd expect from a power word-processor: a fast, intuitive text editing environment, full linguistics support (spell checking, thesaurus and language-use alert), red-lining, change bars and automatic table of contents and index generation.

Rewrite the book

DECwrite includes automatic pagination and page numbering, multiple columns per page, and the ability to mix, for example, a 4-column grid at the top of a page with a 2-column format on the bottom half. Widow and orphan control is also included.

High-quality printed output is provided via Digital PostScript printers including the LN03R desktop printer and PrintServer high-performance network printers.

Get the picture

Line art, photographs and other scanned images produced via the DECimage Scanning Application can easily be included in DECwrite document, with full control over position and size.

Charts may be built from data entered directly into DECwrite, or imported from wherever it resides. Nine different chart formats are available for your immediate use.

Import and export facilities

Bidirectional converters for DX and ASCII formats are included with DECwrite in the VMS and UNIX versions. These and other converters are available with the CDA Converter Library, including AFS, SGML, TIFF, CGM and GKS.

DECwrite	for VMS	SPD 25.F7
LICENCE		
MEDIA		(TK50)

Required Software: VMS Operating System, DECwindows Desktop Environment. **Required Hardware:** A VAXstation with at least 8Mb of memory is required. **Installation:** 23,500 blocks (12,032 Kb). **Operation:** 23,400 blocks (11,980 Kb). Note that a subset of the CDA Converter Library translators are bundled with DECwrite; please call for further details.

DECwrite for OS/2 V1.0		SPD 55.27
LICENCE		
	Media Included	

Required Software: please call for details.

DECwrite	for RISC V1.0	SPD 31.84
LICENCE		
MEDIA		(TK50)

Required Software: ULTRIX/RISC Worksystem Software, DECwindows Desktop Environment. **Required Hardware:** DECstation with at least 16Mb of memory. **Installlation:** 15,625 blocks (8,000Kb) **Operation:** 15,625 blocks (8,000Kb).

DECimage Scan Application

CREATE THE RIGHT IMAGE

Recent developments in scanner technology, coupled with the enhanced capabilities of CDA™-compliant document processing software such as Digital's DECwrite, make image scanning and processing increasingly important in the modern business enterprise.

- Full set of image–scanning and adjustment features.
- Provides for easy transfer of images to other applications.
- Operates with Digital's MD300 Qbus Image Scanner.

DECimage Scan Application offers Digital workstation users the ability to capture and manipulate images prior to incorporation in a compound document. Using standard DECwindows pull-down menu selections, you can set up and control the scanner hardware; capture and preview the image on-screen; carry out any required image editing and adjustment; create files from scanned images; and transfer image files via electronic mail.

DECimage Scan for ULTRIX RISC V2.0 — SPD 31.75

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-YF8A□-AA**	MEDIA	**QA-YF8AA-H□**
DOCS	**QA-YF8AA-GZ**		

Required Software: ULTRIX/RISC Operating System. **Required Hardware:** MD 300 Scanner on network, and at least 12Mb memory in the users RISC processor. **Complementary Software:** DECwrite or any CDA-compliant application. **Installation:** 3198 blocks (1638Kb) **Operation:** 3198 blocks (1638Kb).

DECimage Scan for VMS V2.0 — SPD 25.04

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System
Installation: 10,000 blocks (5.1 Mb) without sample images 4,000 blocks (2.0 Mb)
Operation: 9,000 blocks (4.6 Mb) without sample images 3,000 blocks (1.5 Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VPFA9-J□**	MEDIA	**QA-VPFAA-H□**
DOCS	**QA-VPFAA-GZ**		

CDA Converter Library

NEW VERSION 1.1

BECAUSE SHARING IS WHAT DIGITAL DOES BEST

CDA Converter Library for VMS

The CDA Converter Library lets you convert data from many different formats to Digital's DDIF document interchange format, and from DDIF to multiple formats.

A gateway to integration

The problem many organizations face today is not only obtaining access to the right information, but sharing it among multiple users. The spreadsheets, graphs, and figures that users need may exist on the network, but incompatible file structures may render them very difficult to use. The CDA Converter Library makes a new degree of systems integration possible. By providing a gateway to CDA for a variety of systems including IBM Personal Computer and Apple Macintosh computers, the CDA Converter Library lets you tie more users into your enterprise-wide network and share information — regardless of hardware type, operating system, or file structures.

CDA Converter Library formats		Also included in DECwrite for VMS and VAX ULTRIX	Also included in DECdecision
Text Files (read/write)	• DX — DEC WPS-PLUS and word processor format	✔	
	• DCA — IBM PC word processing standard		
	• SGML — ISO Standard markup language		
	• AFS — Alternate Format Syntax for use with ASCII editors	✔	
Data Files (read/write)	• DTIF™ — CDA Digital Table Interchange Format		✔
	• WK1 — Lotus 1-2-3 V2.x		✔
	• ASCII Tabular — Generic ASCII tabular files	✔	✔
Image Files (read/write)	• TIFF — Tagged Image File Format		
	• MacPaint — Macintosh		
	• MacPaint bitmap format		
One-way converters:	• DIF — Industry standard Data Interchange Format (read-only)		
	• CALCGRD — DECalc V3.0A Binary Grid files (read-only)		✔
	• CGM — ANSI Computer Graphics Metafile (read-only)		
	• DDIF Graphics Hardcopy Converter (write-only, 3 formats)*		
	• HPGL Hewlett-Packard plotter format		
	• Monochrome Sixel format		
	• Colour Sixel format.		

*(DEC GKS V4.0 on VMS or ULTRIX is required to support this DDIF Hardcopy Converter)

CDA Converter Library for VMS V1.1 — SPD 31.31

LICENCE	**QL-VZAA9-AA**	
MEDIA	**QA-VZAAA-H5**	(TK50)

Required Software: VMS Operating System
Comp S/W: Any CDA compliant application, such as DECwrite, DECdecision, VAX Notes, VAX/VTX, etc
Installation: 7500 blocks (3840 Kb)

CDA Converter VAX ULTRIX V1.0 — SPD 31.30

LICENCE	**QL-VZBA9-AA**	
MEDIA	**QA-VZBAA-H5**	(TK50)
or	**QA-VZBAA-HM**	(Tape)

Required Software: VAX ULTRIX Operating System
Comp S/W: Any CDA compliant application, such as DECwrite
Installation: (6,421Kb).

CDA Con. Library for VAX ULTRIX V1.0 — SPD 31.30

LICENCE	**QL-YG9A8-AA**	
MEDIA	**QA-YG9AA-H5**	(TK50)
or	**QA-YG9AA-HM**	(Tape)

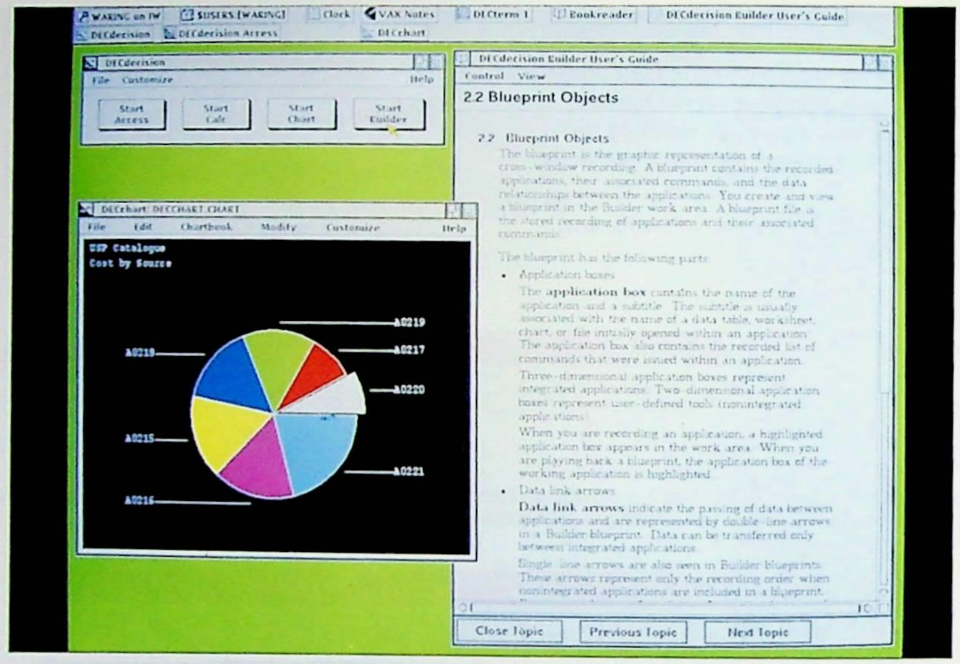
Required Software: ULTRIX/RISC Operating System Individual components can be installed separately. If all converters are loaded, **Installation:** 8,288Kb.

DECdecision

EXTRACTING INFORMATION FROM DATA

DECdecision is a workstation-based, advanced decision support solution. Running under the DECwindows graphical user interface, it enables you to easily access data, transform it into usable information, and then distribute that information in an appropriate graphic format (such as bar and pie charts) for reports or for inclusion into compound documents. Data can be exchanged between DECdecision applications and popular applications that use industry-standard exchange formats. You can also automate tasks using DECdecision's powerful 'learning' capability.

- A powerful decision support tool that provides a single environment for accessing, processing and interpreting data.
- Provides local and remote access to distributed databases, including VAX Rdb/VMS, DATATRIEVE, RMS*, DBMS* and databases on IBM mainframes.
- Data can be exchanged between DECdecision and other applications such as Lotus 1-2-3 and dBASE.
- Fully integrated with CDA (Compound Document Architecture): Digital's LiveLink™ software provides a data connection between DECwrite documents and DECdecision information.



DECdecision is Digital's premier decision support tool, complete with end user blueprinting facilities.

DECdecision ACCESS

The ACCESS component of DECdecision gives you access to local and remote data sources on a network — including VAX Rdb/VMS, VAX DATATRIEVE, VAX RMS, VAX DBMS, and IBM data sources (using VIDA) — all through the friendly DECwindows user interface. With a few clicks of a workstation mouse, you can make complex data queries, create a personal database or generate reports: the graphics-driven approach eliminates the need for you to learn complex database instructions.

DECdecision's import and export facilities permit data sharing with applications that use WK1, DIF and ASCII formats: for example, Lotus 1-2-3 and dBASE.

DECdecision CALC

DECdecision CALC is designed for immediate, productive use, both by novices and more experienced spreadsheet users. A window-based spreadsheet, CALC provides over 100 mathematical, statistical and financial functions. It has sophisticated consolidation capabilities, a state-of-the-art internal macro facility, extensive formatting capabilities, user-defined functions, projection ('what if') analysis, and multiple views of a worksheet.

DECchart

The CHART component of DECdecision enables you to create professional graphics for reports, presentations, or for incorporation into compound documents. Simply specify the data to be charted; DECdecision will automatically generate the chart. CHART provides nine predefined types of charts, including Bar, Line, Pie and Histogram, and combinations.

DECdecision BUILDER

If you find yourself repeatedly carrying out the same sequence of DECdecision tasks and commands, get DECdecision to do it for you via BUILDER.

No programming is required: just carry out the sequence of steps once, and BUILDER will 'watch', recording every move you make. For example, you could perform a DECdecision sequence such as:

'Access the price file, extract all parts costing more than £50, forecast the change in revenue if these parts were increased in price by ten percent, and create a graph.'

That's it — you'll never need to do that task manually again. BUILDER sequences can be chained together to form larger applications, and can be shared, mailed and customised among users.

LiveLink™ — your information connection

If you incorporate DECdecision data into a document created by Digital's powerful DECwrite compound-document editor, you can choose to create a link between your document and the source data in DECdecision. Then, at your discretion, changes made to the source data can be reflected within your document, making updates fast, simple and accurate.

DECdecision requires the VMS Operating System V5.1 or later. VAX Rdb/VMS Runtime is included with DECdecision.

* *Requires Datatrieve to be loaded as a prerequisite.*

DECdecision V1.1		SPD 25.G2
LICENCE	QL-VW3A9-PB	
MEDIA	QA-VW3AA-H5	(TK50)

Required Software: VMS Operating System. With Rdb/VMS **Installation:** 48,500 blocks (25.0Mb) **Operation:** 42,500 blocks (22.0Mb). Without Rdb/VMS **Installation:** 25,500 blocks (13.0Mb) **Operation:** 24,500 (12.5Mb). Note that DECdecision contains all the spreadsheet translators to be found as part of the CDA Converter Library, so no additional purchase of these is necessary.

UNIPLEX

INTEGRATED OFFICE SYSTEM FOR UNIX™

NEW PRODUCT

UNIPLEX Business Software is a suite of UNIX-based office applications designed to handle routine office activities.

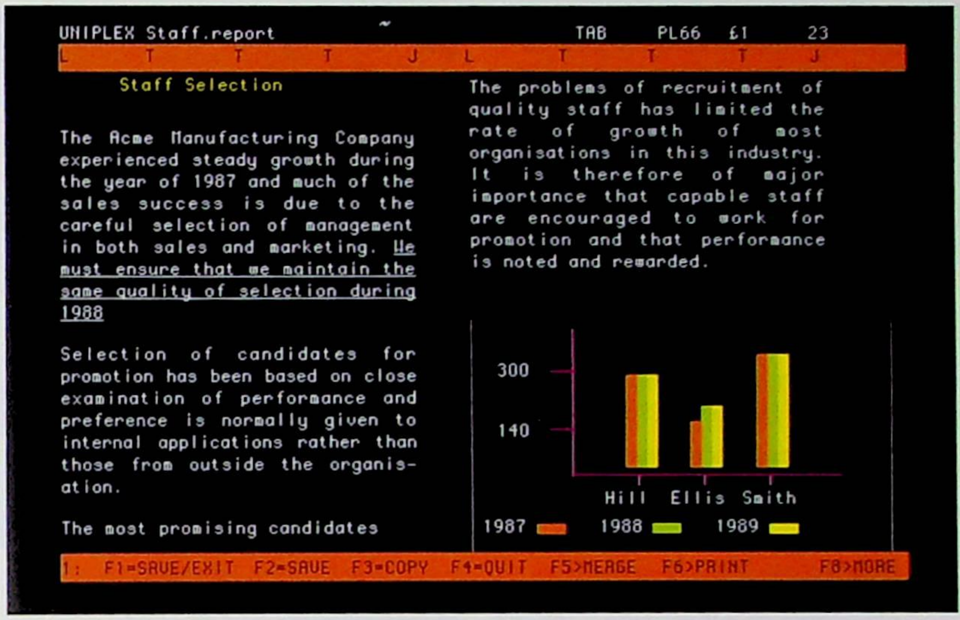
UNIPLEX II Plus, the base program for all UNIPLEX Business Software, provides word processing, spreadsheet, database and business graphics. In addition to UNIPLEX II Plus, several optional applications can be added to expand overall office functionality. The product features:

- Word Processor including dialogue boxes, pop-up menus, spelling dictionary, text formatting and control, automatic justification and many other features.
- Spreadsheet with a choice of UNIPLEX or Industry Standard user interface. Data can be imported from Lotus 1-2-3™, DIF or ASCII. Database integration using SQL from UNIPLEX or external database.
- Integrated database management system or transparent linkages to external databases depending on Base option chosen.
- Business Graphics: Using either high or low resolution terminals and a wide range of dot matrix and laser printers, UNIPLEX allows users to present data dynamically tied to spreadsheet and database information.
- Sketchpad available to create diagrams and sketches.
- Screen and Menu builder menu driven utility to create custom menus and screens.
- UNIPLEX Print Composer prints high quality documentation utilising proportionally spaced text, boxing, multiple columns and various shading abilities (dependent upon printer capabilities). The Print Composer offers support for laser printers, including those running PostScript™.
- System-wide features: UNIPLEX II Plus provides many system-wide features including calculator, clock, calendar, sketchpad, clipboard display, function key support, keystroke recorder and file/folder management.

The basic UNIPLEX II Plus is available in two variants:

The Base I version includes an integrated relational database management system. Data can be addressed by using either the UNIPLEX forms interface (ISSI) or by issuing industry standard Structured Query Language (SQL) commands.

The Base II option does not include the database management system but provides transparent linkages to external databases such as Informix™ or Oracle™. Base I and Base II cannot co-exist.



Multi-column word processing document featuring embedded graphics.

UNIPLEX Advanced Office System (AOS)

UNIPLEX Advanced Office System option is a companion product to UNIPLEX II Plus and provides the functions necessary for group communications and scheduling. These tools include electronic mail, time management, card index, form fill and report writer.

UNIPLEX Electronic Mail is an object-oriented mail facility that allows any type of UNIPLEX file, from memos to graphics, to be mailed. UNIPLEX mail can work with any underlying mail system, though by default it uses standard UNIX mail. With the addition of DECnet-ULTRIX, UNIPLEX can exchange mail with VMS and ALL-IN-1 users, and layering the ULTRIX Mail Connection on this allows UNIPLEX to take full advantage of Digital's NAS strategy, via the MAILbus.

UNIPLEX Advanced Graphics

The UNIPLEX Advanced Graphics (AGS) option, like AOS, is a companion product to UNIPLEX II Plus. AGS provides additional graphics features and functions which allow the creation of presentation-quality graphics. With AGS, users can create a range of graphics, from simple bar graphs to sophisticated 3-D area charts and exploded pie graphs. It has hardcopy capabilities including PostScript models. Included is the Presentation Editor which allows extensive editing of graphics including scaling, rotating and copying.

Additional Dictionary Pack

The Additional Dictionary Pack (ADP) provides support for multiple dictionaries which enables users to spell-check documents containing words in various languages. ADP contains eleven languages: US English, UK English, French, German, Spanish, Italian, Dutch, Swedish, Danish, Norwegian, and Canadian French.

Ordering Information

There is a large number of both Base I and Base II versions based upon numbers of users. Details of these can be found at the rear of the catalogue.

ALL-IN-1

NEW VERSION 2.4

INTEGRATING THE ENTERPRISE

ALL-IN-1 provides a toolbox of standard office applications and development tools that are customised to suit the needs of a user community. ALL-IN-1 works for more users in more languages than any other integrated office system. The package contents include:

- Enterprise-wide Electronic Mail, based on the VAX Message Router MAILbus product.
- Automatic unattended Mail Reply facilities.
- Digital's WPS-PLUS/VMS 'Gold Key' Word Processing System.
- An enterprise-wide directory service, allowing you to look up and address mail to users on any system in your computer network.
- New Time Manager features, including the ability to schedule meetings between users on geographically dispersed ALL-IN-1 systems. Action Items and To-do lists have now been combined.
- New System Administration and Archiving capabilities.
- Built in Computer Based Training.
- Fully integrated Videotex and Computer Conferencing through use of the VAX VTX and VAX Notes optional software products.

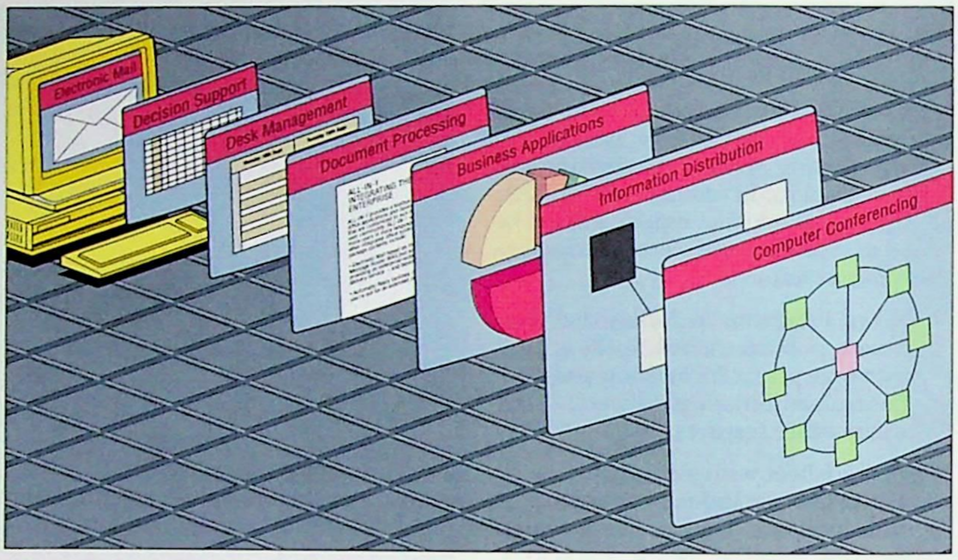
Digital's ALL-IN-1 Integration Platform not only provides users with a basic set of capabilities to be effective today; it also offers a consistent and compatible base from which to build for tomorrow.

Easy to learn

ALL-IN-1's simple menu-driven format makes it easy to learn and easy to use. Because of the consistent user interface, the experience gained in one application can be applied to others.

Customisation

Tools are included that enable ALL-IN-1's common user interface, menus and keyboard to be modified. A full set of application integration documentation is also provided, enabling your system implementers to combine and integrate their own business-specific applications.



By adding applications to the basic ALL-IN-1 set, total solutions can be built to solve your users' needs.

With a consistent user interface and a single file cabinet structure, this level of integration is unique to Digital.

Extensive communications

ALL-IN-1 includes the VAX Message Router and Message Router VMSmail Gateway. If required, you may add one or more of Digital's MAILbus products, opening up communications links to a variety of other user communities. One of the strengths of Digital's MAILbus products is that they can be combined to enable communication between otherwise incompatible messaging systems. ALL-IN-1 capitalises on this unique ability.

New, low-cost options

ALL-IN-1 is now available in a four-user version at a very preferential price. Extra four-user licence packs can be added at any time; this route often offers a cost-saving over the unlimited-user equivalent for a specific size of user community. And, when you choose to upgrade to full, unlimited ALL-IN-1, we will credit you for the four-user licences purchased to date.

A 'Load-and-Go' version of ALL-IN-1, termed ALL-IN-1 Starter, is also available in both unlimited and 4-user user forms. ALL-IN-1 Starter gives you all the same facilities as its full equivalent, minus the Time Management and customisation facilities, at a much reduced price (see Priced Index at rear for details). However, you may still add any of the MAILbus products and, should you wish to upgrade to the full equivalent later, we will give you full credit for the ALL-IN-1 Starter licences purchased to date.

At your service

Digital offer a variety of ALL-IN-1 associated services that can be conducted even when you're unsure of the potential impact of any office system on your business environment. Digital also offer a variety of installation and training services to make your investment in ALL-IN-1 a success for you – and your user community.

ALL-IN-1 V2.4	SPD 27.30
PERSONAL LICENCE per 4 named users	
LICENCE Media kit cost: as price panel below.	

ALL-IN-1 V2.4 SPD 27.30																	
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. If the entire installation is placed on the system disk, 65,000 blocks free are required, 60,000 of which are permanently used. With V2.3, multiple target disks are allowed. The product has been divided into three parts - Library files, Data files and Language files, each can go on a separate device. The number of blocks needed for each are: 27,000 blocks - Library Files. 2,000 blocks - Data Files. 20,000 blocks - Language Files (English). In addition to the above, 15,000 blocks are required on the system disk for non-safety mode installation, of which 3,000 blocks will be permanent.

	TK50 **5** Tape **M**
MEDIA	

LICENCE		MEDIA	
DOCS			

ALL-IN-1 Desktop Products

BUILDING ON YOUR PC AND WORKSTATION INVESTMENTS

Office Systems are much more than just word processing. The historic success of Digital's ALL-IN-1 product was based on its ability to provide seamless access to any application — Digital or third party — from each terminal user's desktop. This, coupled with excellent base document processing and electronic mail, is the foundation on which over a million end users make productive use of their information resources.

Several trends have necessitated the need to evolve the ALL-IN-1 product into a complete product family for the 1990s.

- Around three-quarters of the people accessing ALL-IN-1 systems today do so using Personal Computers in one way or another. We want to give these users better access without compromising their existing investment in desktop hardware.
- The integration of third party applications is becoming multi-platform in nature: ALL-IN-1 capabilities on the host, others from the desktop machine of choice.
- The increased use of (remote) laptop computers.

The initial goal is to provide products that meet these trends for the most common personal systems used by Digital customer sites — for MS-DOS and VMS workstations. Digital will then extend the products to encompass all the (likely) successful desktop systems, including OS/2, ULTRIX and the Apple Macintosh.

ALL-IN-1 meets the intelligent desktop

ALL-IN-1 Desktop requires the presence of an ALL-IN-1–based Server system. The ALL-IN-1 Desktop Server software is loaded on any valid ALL-IN-1 V2.3 or ALL-IN-1 Starter V1.0 system, and provides services to a community of ALL-IN-1 Desktop systems.

Initially, Digital has announced ALL-IN-1 Desktop for DOS and ALL-IN-1 Desktop for VMS DECwindows. These products allow the user the normal freedoms associated with the respective desktop machines, but add value by permitting the sharing of information among the variety of information resources available on the network.

Like the host-based equivalent, ALL-IN-1 Desktop systems are fully customisable and can call on applications as required, whether local or on the host machine. The user has access to the full range of ALL-IN-1 Services, including File Cabinet, Time Management, enterprise-wide message transfer and integrated business applications. The user has access to a full range of mail services, including the ability to process documents at the desk, and also to send locally-sourced files as mail attachments.

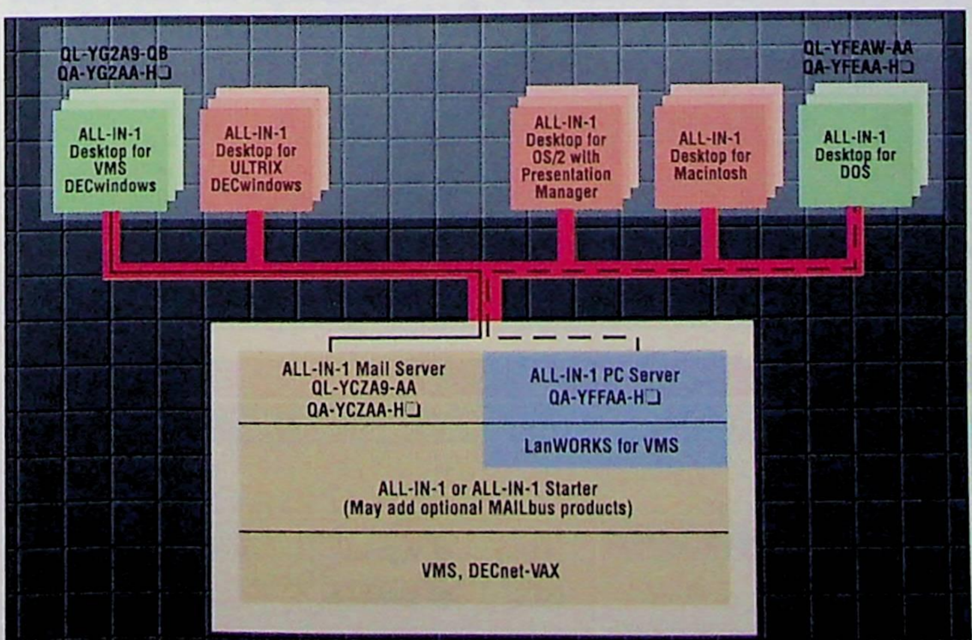
ALL-IN-1 Desktop for DOS and for VMS DECwindows will be joined later by equivalents for the Apple Macintosh, ULTRIX DECwindows and for OS/2. Digital will also enhance the product set to deliver further data access and related services for client systems.

Back to the future

Up until now, ALL-IN-1 has been used primarily as a departmental system, providing terminal users with access to a variety of office applications through a common user interface. The new release distributes the power of ALL-IN-1, so that desktop users can enjoy the best of two worlds: the power of the industry-leading integrated office system, and the productivity and familiarity of the PC or workstation environment.

Note: If you have a need for mail facilities only with minimal use of the other ALL-IN-1 facilities, we recommend use of the ALL-IN-1 Mail products instead.

ALL-IN-1 Desktop integrates preferred desktop devices with the ALL-IN-1 Office Information System… and beyond.



ALL-IN-1 PC Server V1.0 — SPD 31.71

LICENCE		Included In ALL-IN-1 and ALL-IN-1 Starter
MEDIA		**QA-YFFAA-H5** (TK50)
	or	**QA-YFFAA-HM** (Tape)

Required Software: ALL-IN-1 V2.3 or Starter V1.0 running on VMS V5.0-2 or later. DECnet-VAX and LanWORKS for VMS also needs to be loaded on the server.

ALL-IN-1 Mail Server V5.1 — SPD 31.51

LICENCE		**QL-YCZA9-AA**†
MEDIA		**QA-YCZAA-H5** (TK50)
	or	**QA-YCZAA-HM** (Tape)

† Need 1 per PC

Required Software: VMS Operating System V5.1 or later. **Optional Software:** ALL MAILbus products. **Installation:** 20,000 blocks (10.2Mb) **Operation:** 15,000 (7.7Mb).

ALL-IN-1 Desktop for DOS V1.0 — SPD 50.20

LICENCE		**QL-YFEAW-AA**†
MEDIA		**QA-YFEAA-HB** (3.5" 720Kb Disk)
	or	**QA-YFEAA-HI** (5.25" 360Kb Disk)

† Need 1 per PC.

Required Software: ALL-IN-1 PC Server, DECnet-VAX and LanWORKS for VMS V2.2 or later on server. MS-DOS (V3.2,V3.3) or PC-DOS (V3.2,V3.3 or V4.0), LanWORKS for DOS V2.2 or later on PC. **Required Hardware:** Any PC configuration supported by LanWORKS for DOS Software, with a minimum of 640Kb memory and access to (either local or on a VAX server) 2.5 Mb disk space. A local floppy drive and supported network connection (Ethernet or Asynchronous line) are also required.

ALL-IN-1 Desktop for VMS DECwindows V1.0

LICENCE		**QL-YG2A9-QB**†
MEDIA		**QA-YG2AA-H5** (TK50)
	or	**QA-YG2AA-HM** (Tape)

† Need 1 per Workstation.

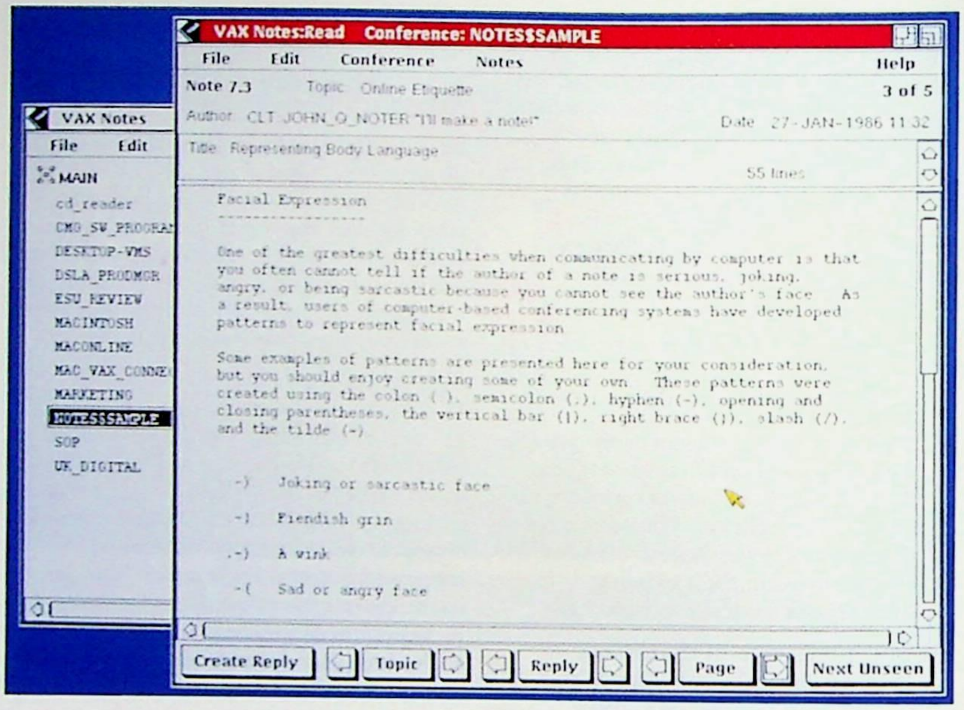
Required Software: VMS Operating System V5.3 or later, DECnet-VAX on workstation. ALL-IN-1 V2.3 or later, VAX Notes and the ALL-IN-1 Mail Server Software loaded on the Server.

VAX Notes

MEETING OF THE MINDS

Imagine a conference without a venue, a meeting to which no one has to travel, a discussion which you can join halfway through without missing a word, a dialogue in which every word is unerringly recorded. This is VAX Notes, one of the most powerful communication tools used by Digital — and one of the most significant ways of improving the exchange of information within your organisation.

- Computer conferencing: self-documenting dialogue and discussion without limits of time, location or topic.
- Increases both the quantity and quality of information exchange within an organisation, without time, expense, access and travel problems.
- Simple-to-use software enables new users and experts to participate with equal effectiveness.
- Available for all Digital VMS systems; accessible from DCL, DECwindows or ALL-IN-1 user interfaces.



VAX Notes enables you to participate in on-line conferences and meetings without leaving your desk.

VAX Notes is computer conferencing software that enables you to create and participate in on-line conferences and meetings without leaving your desk. A detailed record of conference proceedings is maintained automatically, so you can join a discussion at any time and catch up with the preceding flow of ideas. Depending on the extent of your Digital network, VAX Notes reaches into every corner of your organisation, and outside to regional and international offices.

VAX Notes uses a simple topic-and-reply format. Conferences may have more than fifty thousand topics, and a similar number of replies. Topics and replies are titled and kept in chronological order, making it easy to locate the subject in which you're interested. Digital's CDA (Compound Document Architecture) is supported, allowing the inclusion of text, data, graphics and images in a conference.

Easy to use

All VAX Notes functions are accessed either by typed commands through a character-cell terminal or, in DECwindows, via a pulldown menu. And of course, on-line Help is available for all commands. VAX Notes makes use of Digital's comprehensive electronic mail capabilities, so you can actually mail a note to another person, or send a reply via electronic mail to the author of a note —all without leaving the VAX Notes conference.

VAX Notes conferences can be open to anyone on the network, or they can be limited to a select group. At any time, members can be added or removed from the restricted list.

A cost-effective solution

VAX Notes is designed using client/server technology to achieve rapid response. The Server option allows access to all of VAX Notes' capabilities, while the lower-cost Client option omits the ability to create new conferences.

VAX Notes V2.1	SPD 27.06
USER BASE LICENCE per 4 named users	
LICENCE	QL-960A9-PD

VAX Notes V2.1 SPD 27.06																	
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet-VAX if you wish to access remote conferences. **Installation:** 4,800 blocks (2.5Mb). **Operation:** 3,800 blocks (1.9Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-960A9-J	MEDIA	QA-960AA-H
DOCS	QA-960AA-GZ		

VAX Notes Client V2.1 SPD 27.06																	
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, DECnet-VAX if you wish to access remote conferences. **Installation:** 4,800 blocks (2.5Mb). **Operation:** 3,800 blocks (1.9Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-VESA9-J	MEDIA	QA-960AA-H
DOCS	QA-960AA-GZ		

VAX VTX

NEW VERSION 4.1

HARD FACTS WITHOUT HARD COPY

Every organisation produces information — vast stores of it. The challenge is to publish this information to large numbers of people throughout your organisation… even though many of them may be in a different building, a different country. That's where VAX VTX comes in.

- Corporate videotex software for electronic information distribution; eliminates the cost and time overhead of hard-copy distribution.
- Supports CDA (Compound Document Architecture); allows inclusion of text, data, graphics and images.
- Ensures accurate and up-to-date information is distributed throughout your organisation; inconsistent or obsolete data is instantly eliminated.
- Available for all Digital VMS systems; accessible from DCL, DECwindows, ALL-IN-1 user interface and now Apple Macintosh and MS-DOS interfaces.



Publishing without paper

The printed word has its strengths, but flexibility isn't one of them. Producing, storing and updating hard copy is difficult and costly. All too often, information is out of date even as it's being (expensively) printed and distributed. By publishing electronically, you gain the ability to switch the flow of information on and off like a tap. Out-of-date information can be replaced instantly, thus preventing the use of obsolete or inconsistent data. Policy manuals, directories, product specifications, reference handbooks and newsletters are all excellent candidates for VTX-based circulation.

Simple. Secure. Self-explanatory.

You need no training to use VAX VTX… all you need is system access. Self-explanatory menus guide you through the system to the information you need. Combine this with keyword search and you spend less time looking for information and more time using it! The greater accessibility of information does not mean that security is compromised. Access-limiting features are part and parcel of VAX VTX.

VAX VALU

VAX VALU (VTX Application Load Utilities) part of VAX VTX enables programmers to effect a two-way VTX service capable of collecting information from, and distributing information to individuals.

A cost-effective solution

VAX VTX offers a distributed computing architecture, and is based on client/server technology. The Terminal Concentrator Licence, Remote Update Licence, and VALU Run Time Licence are no longer necessary, and these components may now be used on any node in your network in conjunction with a valid VTX server licence.

VAX VTX Starter — SPD 26.57

LICENCE	QL-031A9-PF	
MEDIA	QA-031AA-H5	(TK50)

Product description: A 16 concurrent users licence VMS V5.3.

VAX Starter Connects — SPD 26.57

LICENCE	QL-YQSA9-PD
MEDIA	Not required

Product description: 4 additional users for VAX VTX starter.

VAX VTX V4.1 — SPD 26.57

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS V5.3 Operating System, DECnet-VAX when remote access to the infobase is required (adding VAX VTX Terminal Concentrator on the remote machines). **Complementary Software:** CDA compliant product. **Installation:** 37,000 blocks (18.8Mb). **Operation:** 20,000 blocks (10.3Mb) with TSM option, 8,500 blocks (4.4Mb) without.

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-031A9-J	MEDIA	QA-031AA-H
DOCS	QA-031AA-GZ		

WPS-PLUS

THE GOLD STANDARD IN WORD PROCESSING

WPS-PLUS is Digital's leading word processing solution. It's powerful enough for the 'power users' in your organisation — the writers and secretaries — yet simple enough to score highly with the non-full-time WP users such as managers and technicians.

- Menu-driven document processing software providing 'Gold Key' style word processing for VMS and MS-DOS-based users.
- Integrated, 87,000-word British English spelling verifier and corrector, and on-line electronic thesaurus*.
- Inbuilt math, list processing, sorting and macro capability.
- Integrated filing system using the popular file-cabinet/wastebasket metaphor.

Power word-processing

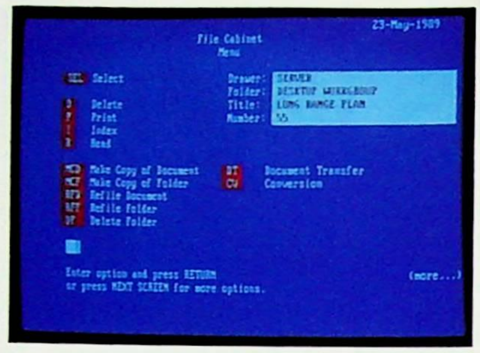
At its simplest, WPS-PLUS lets you create, edit and print documents via an intuitive, cursor-key controlled screen editor and a simple menu-driven interface. At its most powerful, you'll find all the features on the power user's wish-list (*see WPS-PLUS has it!*).

It speaks your language

WPS-PLUS includes interactive features to help you write text quickly and accurately. A spelling verifier and corrector traps errors before they're committed to paper — including capitalisation and common typing errors.

The spelling database contains over 87,000 words in British English, and you can add up to 12,000 of your own (see panel for WPS-PLUS/DOS-specific parameters). These user-specific words can be divided between your personal dictionary and up to ten other custom dictionaries, so by simply using the right dictionary, you get context-sensitive checking.

Lost for words? A simple Gold Key command away is a powerful electronic thesaurus, based on the respected Houghton Mifflin 'ROGET'S II: THE NEW THESAURUS'. Just select a word and you'll get synonyms, including inflections (i.e., –ed, –ing, –ly) and short definitions for that word.



WPS-PLUS presents a menu-driven interface that both new and experienced users will find easy to use.

WPS-PLUS has it! ✔

- ✔ Verify and correct spelling, capitalisation and word usage, and call up an electronic thesaurus (English and American versions only)
- ✔ Retrieve documents by name, number, or keyword
- ✔ Assemble standard documents quickly by 'boiler-plating' from library documents and calling up text from your own glossary of words and phrases
- ✔ Include numbered footnotes or end-notes in a document
- ✔ Number paragraphs up to nine levels deep
- ✔ Automatically generate a table of contents
- ✔ Automatically generate an index or a table of authorities
- ✔ Use change bars and red-lining to highlight text changes and deletions
- ✔ Cut and paste, within a document, between documents, and to and from columns of text
- ✔ Automatically prevent typographic 'widows' and 'orphans'
- ✔ Switch discretionary hyphenation on and off as required
- ✔ Produce form letters and maintain mailing lists
- ✔ Import data from a VMS application via 'Gold Get', and create links to a variety of Digital software products using the External Application Link (XAL)
- ✔ Include technical characters, scientific equations, diagrams, matrixes, and VT100 line drawing character set equations in a document
- ✔ Search and search-and-replace; specify formatting attributes such as bolding and underlining as search parameters
- ✔ Specify left-justified, right-justified, and decimal-aligned tabs
- ✔ Move through your document and select text by character, word, line, sentence, paragraph, or page
- ✔ Create and display documents up to 256 characters wide
- ✔ Store ten ruler templates for immediate recall
- ✔ Embed printer-specific commands in any document, as well as non-printing comments
- ✔ Perform 4-function math
- ✔ Learn at your own pace via on-line training

Beyond words...

List processing, sorting and math are there if you need them. You can merge a list of names and addresses with a letter or report, with specified selection criteria, to create mass mailings or customised documents.

The built-in Two-Dimensional Editor (TDE) allows you to create diagrams, scientific equations, line drawings, charts, matrices and VT100 character set equations. Full composite-character and Multinational Character Set support is also built in, and multi-column tables are no problem.

WPS-PLUS allows you to automate a repeated key sequence by creating a User Defined Process (UDP or 'macro') to eliminate the monotony.

Another important component is the powerful Help feature providing training for the novice and a memory refresh for the more experienced.

Familiar storage metaphor

WPS-PLUS features an integrated filing system, using the familiar file cabinet/wastebasket metaphor. Each user gets his or her own file cabinet — and look at what's in store:

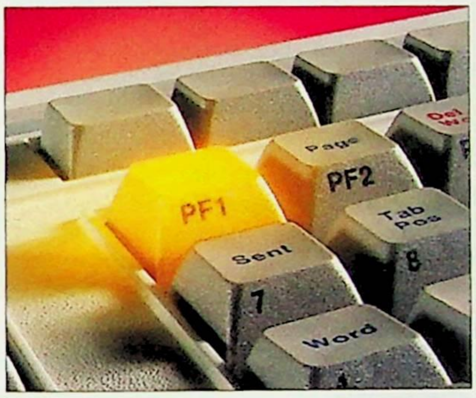
- Document names up to 70 characters long, folder names up to 30 characters long. No more enigmatic or meaningless filenames like MTH2REPT.TXT!
- User-defined keywords for each document: finding that report you wrote two months ago is a snap. You can also retrieve documents by folder and document name or system-assigned number.
- A document and folder index that can be viewed while selecting a document. You can also delete, copy, or cross-file documents in other folders.
- Deleted documents are stored in a wastebasket folder until the basket is explicitly emptied by you.

NEW VERSION 3.1A

WPS-PLUS/DOS

Other Spelling Lexicons

Dictionaries for French, German, American Business and American Medical are also available as separately licensed options for WPS-Plus/VMS. See Priced Index for further details.



Digital's Gold Key keyboards provide rapid access to WPS-Plus functions for both novice and experienced users.

Spelling System licensed under U.S. Pat. No. 4,580,241 and Canadian Pat. No. 1,203,916 © 1985 Houghton Mifflin. All rights reserved.

Based on The American Heritage Dictionary.

Houghton Mifflin Usage Alert © 1984 Houghton Mifflin. All rights reserved.

ROGET'S II Electronic Thesaurus © 1984 Houghton Mifflin. All rights reserved. Based on ROGET'S II: The New Thesaurus.

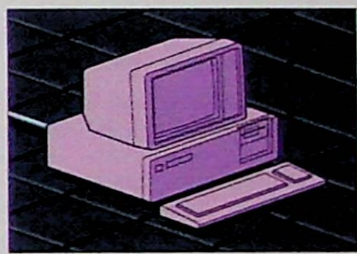
** English and American versions only. WPS-PLUS/DOS dictionary size differs.*

WPS-PLUS for DOS-based PCs

WPS-PLUS/DOS offers virtually the same functionality as its VMS-based counterpart. Designed for DECstation™ PC, VAXmate™, IBM® PS/2®, IBM® PC/XT™ and IBM® Personal Computer AT™ users, its enhanced communication features and support for the PCSA workgroup environment make WPS-PLUS/DOS the right PC word processing solution when network integration is important.

Key differences and features:

- PCSA support provides PC workgroups with shared drawers, server printing and many new features.
- The WPS-PLUS/DOS editor can be invoked directly from the DOS command line on a text file, or directly from other applications. This allows users to use WPS-PLUS/DOS as their editor of choice with products such as ALL-IN-1 Mail for DOS and ALL-IN-1 Desktop for DOS.
- PC-specific features include User-Defined Key (UDK) support, file conversion capability (.WPL, .DX, ASCII), and document transfer between the PC and the Digital host. V3.1 adds Ethernet based Network File Transfer (NFT) support between WPS-PLUS/DOS and its host-based equivalents. Single and multiple documents can be transferred between supported WPS-PLUS/DOS and DECmate systems using the DECmate Floppy Utility. Date and time stamping is supported.
- In the British English version of WPS-PLUS/DOS V3.0, the spelling lexicon contains over 80,000 words in British English preferred spelling and users can add approximately 750 additional words to a personal dictionary (based on an average word length of 6 characters).
- Support for VMS Services for PCs makes it possible for multiple PC users connected to a VAX server to share WPS-PLUS/DOS software. This means that WPS-PLUS/DOS can be installed on the VAX server where a file drawer can be stored and a server printer can be accessed.



- Shared Drawers: By using a PCSA file server directory as the location for a 'server drawer', multiple users can access the same folders and documents, providing true document sharing in the PC workgroup environment.
- Server Printing: Utilises PCSA server printers for both 'print screen' and document printing operations. WPS-PLUS/DOS V3.1 also includes customisable Printer Tables with example tables for several popular printers.
- Terminal Emulation: Includes a new SETHOST terminal emulator which provides VT200 series terminal emulation with an extensive scripting facility.

WPS-PLUS/DOS V3.1A		SPD 30.70

LICENCE	
MEDIA	(3.5")
or	(5.25")

Required Software: MS-DOS V3.1, V3.2 or V3.3. **Complementary Software:** LanWORKS for DOS, LanWORKS for VMS. **Required Hardware:** DECstation 200 or 300 Series Systems, VAXmate, IBM PS/2 Systems, IBM PC/XT and IBM Personal Computer AT Systems (XT/286 excluded). Each system must have prerequisite load media and at least 640Kb of memory. Systems should possess a local winchester disk of at least 10Mb in size. In order to transfer documents between a DECmate and a DECstation system, a 5 1/4 inch, 1.2MB diskette drive is also required.

WPS-PLUS/VMS V3.1											SPD 26.27					
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX FMS Forms Driver. **Installation:** 25,000 blocks (12.8Mb). **Operation:** 21,000 blocks (10.7Mb). If installation is not placed onto the system disk, 6,000 blocks (3.1Mb) of it is still used. Additional Language Lexicons require Installation: 1,800 blocks (0.92Mb), **Operation:** 1,700 blocks (0.87Mb).

	TK50 **5** Tape **M**
MEDIA	

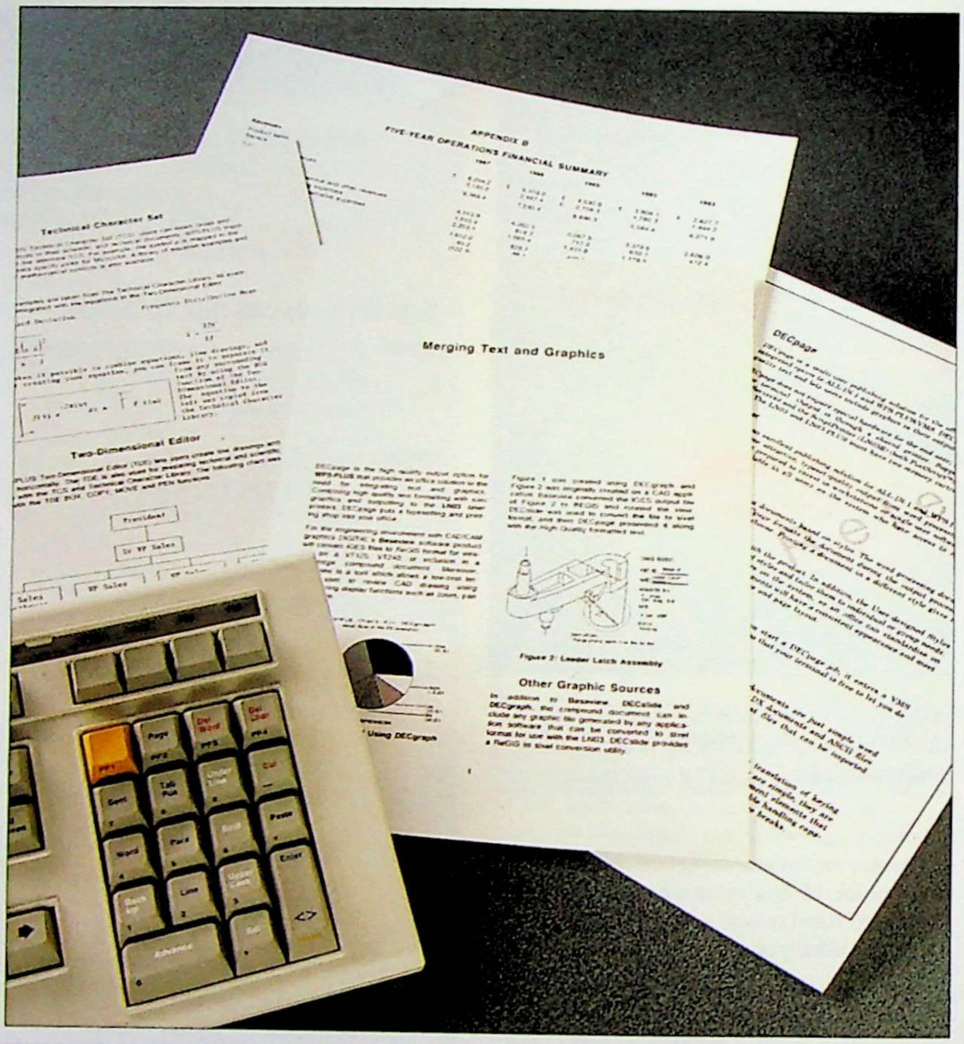
LICENCE		MEDIA	
DOCS			

DECpage

TURNING TEXT INTO FINISHED DOCUMENTS

If you're a WPS-PLUS user looking for a simple, automatic method of turning your text into finished documents, DECpage is the answer.

- Automatically turns word-processed text into finished, typographically optimised documents, previewable on-screen.
- Integrates text with diagrams and graphics, including PostScript® illustrations.
- 37 professionally designed, user-modifiable print styles.
- Full foreign-language support — accents, special characters, even hyphenation.



DECpage gives WPS-PLUS/VMS users the ability to generate documents to a consistently high standard.

DECpage takes word-processed text from WPS-PLUS and turns it into superbly-finished documents. It automatically selects the right fonts, hyphenates and justifies your text, numbers pages, generates a table of contents, and effortlessly integrates graphics and diagrams into your document, complete with captions.

With DECpage, any user in your organisation can generate documentation to a consistently high standard, without the need for special training in typography or document design. You get smart, fully 'designed' documents that conform to your chosen house style, incorporating your company logo if required.

DECpage is designed as an optional extension to WPS-PLUS/VMS and ALL-IN-1. When installed, it appears on the WPS-PLUS Document Processing Menu, and WPS-PLUS documents can be selected directly from the DECpage menu.

Versatile document styles

DECpage is a style-driven formatter: it works by applying pre-defined styles to word-processed text from WPS-PLUS. It comes with 37 professionally designed styles, from which most standard office documents can be generated: memos, reports, even newsletters and overhead transparencies. You can easily modify these styles if required

Output is via a Digital laser printer (LN01, LN03, LN03-PLUS), using normal, italic, and bold fonts in a variety of proportional spaced typefaces and several character sizes.

Graphics support

You can incorporate Sixel, ReGIS, or GKS files into your documents simply by specifying a size, a caption if desired, and the name of the graphic file to be included in the final output. DECpage locates the graphic file and positions it automatically, moving it in step with subsequent revisions to document text. DECpage also supports PostScript graphics.

DECpage allows you to preview documents on any VT terminal, before committing yourself to paper. You can see heading positions, line endings, page breaks and the position of graphic elements.

Other key features: *Definable page size, trim and type-area margins. Optional crop marks. Selectable, automatic page numbering, label text, hyphenation, table of contents generation. Graphics sizing. Super/subscripts. Half-line spacing. End notes and appendixes. Justified text within a column. Multi-column document formats. Widow and orphan control. Full DEC-standard 169 support. Multinational Character Set (MCS) compatible; also supports ASCII, Technical, and Line Drawing character sets.*

DECpage V3.1											SPD 26.29						
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, WPS-PLUS/VMS. **Complementary Hardware:** A Digital PostScript Printer is recommended, with appropriate device support software. **Installation:** 40,000 blocks (20,480 Kb). **Operation:** 35,000 blocks (17,920 Kb).

MEDIA	TK50 **5** Tape **M**

LICENCE		MEDIA	
DOCS			

VAX Document

PUBLISHING USING A MARK-UP LANGUAGE

VAX Document is an electronic publishing system which allows VMS users to produce high quality technical documentation using a mark-up language. Most of the VMS manual set was produced with this product, which features:

- Simple typesetting language (Generic Mark-up Language), providing a consistent document formats even with multiple authors.
- Table of Contents and cross-reference generation; integration with other Digital productivity tools such as LSE and CMS.
- Support for Multinational Character Set and SIXEL graphics, with high-quality print output to any Digital PostScript laser printer.
- New! DOD-STD-2167A support with LSE templates.

Generic Mark Up Language

With VAX Document, you create a source file using any VMS editor and add layout commands to identify text elements. These are independent of the formatting information, which is stored in a separate file and used only when the file is processed. Thus, you can concentrate on the writing task instead of worrying about complex format coding or pagination parameters.

The VAX LSE (Language Sensitive Editor) possesses SGML language templates specifically for use in conjunction with VAX DOCUMENT.

Document layout

Several document 'styles' are provided with VAX Document (see panel below). You can alter these standard document types or create new ones to suit your requirements.

LETTER:	Personal or business letter
ARTICLE:	Two-column or multi-column article
REPORT:	General document
MANUAL:	Handbook
MILSPEC:	DOD-STD-2167A support through the use of LSE templates for the appropriate Data Item Descriptions
OVERHEADS:	35 mm slides, transparencies for overhead projectors.
SOFTWARE:	User manual with software-specific information.

VAX Document V1.2 SPD 27.55

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Complementary Software:** VAX Language Sensitive Editor (LSE). **Installation:** 17,600 blocks (9011 Kb). **Operation:** 16,350 blocks (8371 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-VEEA9-J**	MEDIA	**QA-VEEAA-H**
DOCS	**QA-VEEAA-GZ**		

VAX TEAMDATA

NEW VERSION 1.4

FLEXIBLE INFORMATION MANAGEMENT

VAX TEAMDATA is an easy-to-use information management tool that enables non-programmers to create relational databases, gain access to VAX databases, or carry out spreadsheet and business graphics analysis. With VAX TEAMDATA, you can:

- Share data locally and remotely in a variety of storage formats.
- Access data stored in Rdb/VMS databases by TEAMDATA or by other Rdb/VMS applications.
- Manipulate personal data as well as shared or remote databases in tables, spreadsheets, reports, and business graphs.
- Perform complex query and data reduction operations.
- Organise your data-managing environment by creating folders and subfolders.

TEAMDATA— an easy-to-use information management tool to assist you with day-to-day data management and analysis, provide you with access to corporate data without assistance from MIS, and give you business graphics, spreadsheet and report-generation capabilities.

- A comprehensive, integrated set of tools for information management and decision support.
- Simple tables for data manipulation, spreadsheets for data analysis, and business graphics for displaying data.
- Transparent access to information stored in local and remote VAX Rdb/VMS and DBMS databases, and VAX RMS files. (VAX Datatrieve is required to directly access RMS files from TEAMDATA.)
- Simple menus and comprehensive on-line help and tutorials. Menu-bypass commands for expert users.
- Tightly integrated with ALL-IN-1, Digital's Office Information System.

VAX Teamdata V1.4 SPD 27.02

USER BASE LICENCE per 4 named users
LICENCE

VAX Teamdata V1.4 SPD 27.02

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX Rdb/VMS or VAX Rdb/VMS Runtime. **Installation:** 12,500 blocks (6.1Mb). **Operation:** 9,800 blocks (4.8Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE		MEDIA
DOCS		

Lotus 1-2-3

RDB/VMS USERS WIN!

Lotus 1-2-3 for VMS and Lotus 1-2-3 for ALL-IN-1 are fully compatible, native versions of PC-based Lotus 1-2-3 V3.0 with added features for the networked office:

- File, Macro and Data sharing between VMS platforms and the PC version's worksheet files stored on a PCSA file service.
- Ability to read information directly from VAX Rdb/VMS databases, plus IBM DB2™ data (via VAX VIDA products) without re-keying.
- Access from both terminals and DECwindows workstations.
- Supports any host-connected Digital PostScript™ and LJ250/LA324 Colour Printer.
- Lotus 1-2-3 for ALL-IN-1 additional facilities include the ability to mail spreadsheets worldwide using ALL-IN-1 Electronic Messaging.

Lotus 1-2-3 V3.0

The VAX versions of Lotus 1-2-3 contain identical functionality to that found in the latest release of the MS-DOS version, with significant enhancements for the Digital networked environment.

Key changes from previous versions of 1-2-3 include support for three-dimensional and very large spreadsheets. To date, users of IBM-PC and PC/XT class machines have been unable to run 1-2-3 Release 3.0; now they can access full Release 3.0 functionality in terminal emulation mode without replacing their machines.

Two Versions

Lotus 1-2-3 is offered in two versions: one for standalone VMS and the other integrated with ALL-IN-1. The user interface is identical to that found on the PC version in both cases.

When run via DECwindows the user can display up to 26 spreadsheets simultaneously, generate live graphics in a separate window and re-size the spreadsheet window.

The user has the ability to re-map the keyboard layout if desired. This is likely to be a common need for people using terminal emulators on Personal Computers, where the function key layout doesn't reflect that of a Digital keyboard.

ALL-IN-1 Integration

Lotus 1-2-3 for ALL-IN-1 integrates seamlessly with the ALL-IN-1 Integrated Office System, building on the features present in Lotus 1-2-3 for VMS. Spreadsheets may be stored in the ALL-IN-1 file cabinet, and mailed using ALL-IN-1 Electronic Messaging to any other ALL-IN-1 user worldwide.

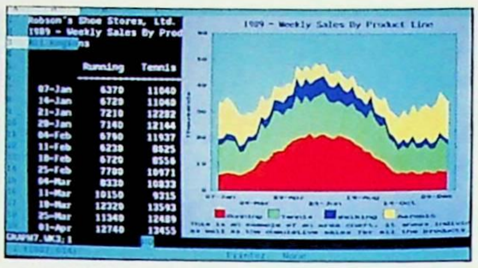
Lotus 1-2-3 for ALL-IN-1 also provides a choice of PC or ALL-IN-1 'Gold Key' user interface, support for the ALL-IN-1 Scratchpad and can print to any printer known to the ALL-IN-1 system.

Maintaining your investment in worksheets

Great care has been taken to enhance the interoperability between the VAX and PC versions of 1-2-3. Personal Computer sourced Worksheet files stored in a PCSA file service (i.e.: a VMS directory) can be retrieved directly (/FR) by the VMS versions of 1-2-3; no other translation is required.

Database Access

Lotus 1-2-3 for VMS and Lotus 1-2-3 for ALL-IN-1 can both read information in VAX Rdb/VMS databases directly using VAX SQL Services (provided at no extra cost in VAX Rdb/VMS V3.1 or later). Hence users of VAX Rdb/VMS do not need to invest time in re-keying (and introducing errors into!) such information before manipulating it in a familiar spreadsheet environment.



Lotus 1-2-3 for VMS and ALL-IN-1 provides the ability to read Rdb/VMS databases directly, without the need to re-key pertinent data..

IBM DB2 databases can also be accessed directly from the VAX versions of 1-2-3 through use of the VAX VIDA (VAX-IBM Data Access) product. Like the VAX Rdb/VMS equivalent, the databases accessed can reside anywhere on any enterprise-wide computer network.

Lotus 1-2-3 for VMS V3.0	SPD 32.20
VS 2000	
VS 3100	
VS II	

1 kit required per VAXstation

Required Software: VMS Operating System, at a minimum of V5.2 **Required Hardware:** All VAX systems 6Mb of RAM 14,000 blocks (7.2Mb) of available disk storage. KEYSTRIPS AV-PE48A.

Lotus 1-2-3 for ALL-IN-1	SPD 32.21
VS 2000	
VS 3100	
VS II	

1 kit required per VAXstation

Required Software: VMS Operating System, at a minimum of V5.2 , ALL-IN-1 V2.3 ALL-IN-1 Starter not supported.
Required Hardware: All VAX systems 8Mb of RAM 20,000 blocks (10Mb) of disk storage.

Lotus 1-2-3 for VMS V3.0 — SPD 32.20

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, at a minimum of V5.2
Required Hardware: All VAX systems 6Mb of RAM 14,000 blocks (7.2Mb) of available disk storage. KEYSTRIPS AV-PE48A.

TK50 **5** Tape **M**	LICENCE		MEDIA	
MEDIA	DOCS			

Lotus 1-2-3 for ALL-IN-1 V3.0 — SPD 32.21

TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VMS Operating System, at a minimum of V5.2 , ALL-IN-1 V2.3 ALL-IN-1 Starter not supported. **Required Hardware:** All VAX systems 8Mb of RAM 20,000 blocks (10Mb) of disk storage.

TK50 **5** Tape **M**	LICENCE		MEDIA	
MEDIA	DOCS			

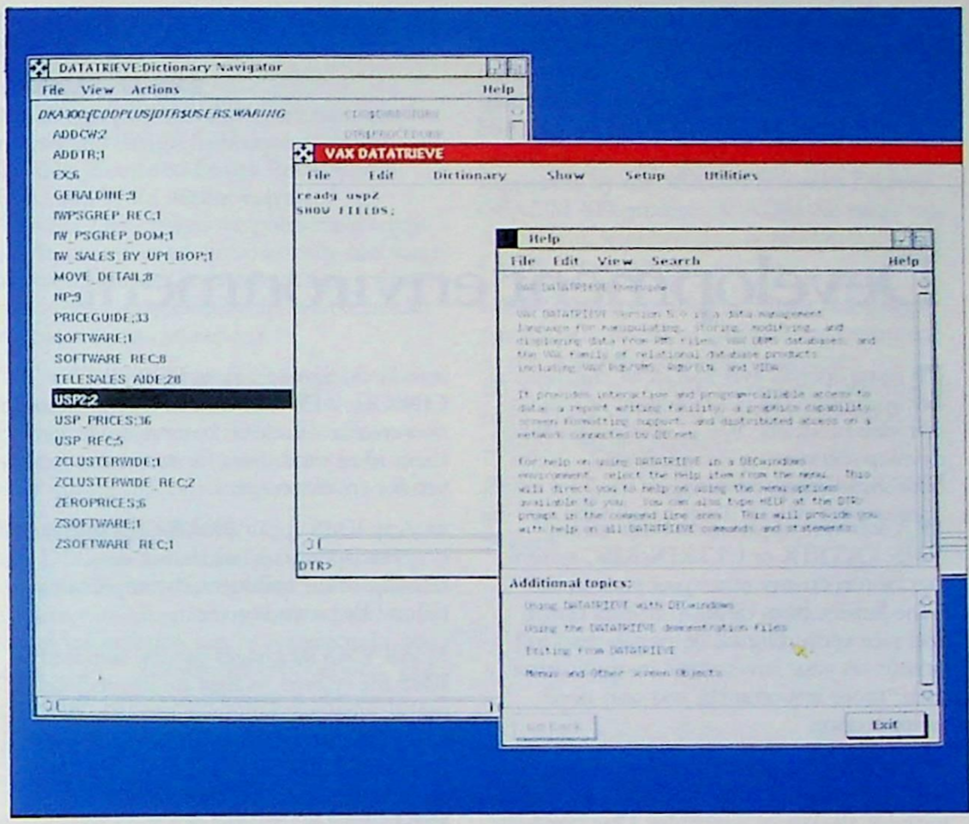
VAX DATATRIEVE

EASY ACCESS TO THE FACTS

VAX DATATRIEVE is a tool for managing and manipulating data either interactively at a terminal or from an applications program. By learning a handful of simple, English-like commands and statements, you can interactively retrieve, store, modify, and sort data, and report on it in a variety of ways.

With VAX DATATRIEVE, you can:

- Create data definitions that can be used to store and retrieve data uniformly, either interactively or from application programs.
- Store or modify data in local or remote RMS files, VAX DBMS databases, or VAX Rdb/VMS databases.
- Retrieve data from RMS files, VAX DBMS databases, or VAX Rdb/VMS plus IBM-based databases, and display the data on a terminal, write it to a data file, or print it on paper.
- Produce formatted reports using specified selections of data.
- Create pie charts, bar graphs, line graphs, and scatter graphs based on specified selections of data.



New! Optional DECwindows Interface

VAX DATATRIEVE now provides a DECwindows user interface, from which a user can look at the current DATATRIEVE environment, examine data and its structure, and manipulate the CDD/Plus Data Dictionary contents. These capabilities are in addition to the traditional DATATRIEVE command line interface.

Target Audience

VAX DATATRIEVE is intended for a broad spectrum of users, including:

- Managers who need ready access to different views of data for decision-making or supervision.
- Organisations requiring a data storage system that can be run by clerical personnel.
- Organisations that need seamless access to data on a distributed network.
- Applications programmers who want to save coding/debugging time and source space by having VAX DATATRIEVE format, sort and convert data as well as look after file handling (eg. find, open, read and write operations).

VAX DATATRIEVE, with its simple English like statements and Guide Mode tutorial facility, will appeal to the occasional user as well as the professional computer user.

Power with simplicity

- Extensive use of the VAX Common Data Dictionary/Plus (VAX CDD/Plus), making it unnecessary for DATATRIEVE users to specify locations and definitions as they would with a traditional programming language.
- An English-like query language for easy access to data stored in RMS files, VAX DBMS and VAX Rdb databases.
- An Application Development Tool (ADT) that provides a simple, interactive means of defining record formats, RMS files, and VAX DATATRIEVE procedures.
- A Report Writer to create formatted reports on any desired selection of data.
- Support for the forms management facilities of VAX FMS and VAX TDMS to format the screen for data display or collection purposes.
- Graphics support for a variety of colour or black-and-white charts and plots.
- A distributed access facility to access data stored on remote systems.
- Security and protection facilities to limit access to data definitions and protect them from corruption.

VAX DATATRIEVE functions (including data access) can be called from programs written in any high-level VAX programming language such as VAX COBOL, VAX FORTRAN, or VAX PL/1.

VAX DATATRIEVE V5.0		SPD 25.44
USER BASE LICENCE per 4 named users		
LICENCE **QL-898A9-PD**		
Media kit cost: as price panel below.		

VAX DATATRIEVE V5.0 SPD 25.44																	
CLUSTERWIDE	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**	**Q**	**S**	**T**	**U**	**V**
LICENCE PRICE																	

Required Software: VMS Operating System. **Complementary Software:** VAX Rdb/VMS, VAX DBMS. **Installation:** 16,000 blocks (8.9Mb). **Operation:** 11,000 blocks (5.63Mb).

TK50 **5** Tape **M**	LICENCE **QL-898A9-J**	MEDIA **QA-898AA-H**
MEDIA	DOCS **QA-898AA-GZ**	



Development environment

Digital spends over half of its engineering budget on the development of quality software products. We — and people who develop software on our platforms — also have some unfair advantages:

1) A software application built on any VMS, ULTRIX or ULTRIX/RISC system can be run on any other processor in the same family, from desktop to data centre and vice versa. Digital helps you reap full benefit on your investment in application code; more importantly, you only need write it once!

2) Applications written in any VMS language can call code written in any other, without the use of assembler. One symbolic debugger is used for testing software written in any one or a combination of languages.

3) Digital provides an array of standard computer languages that obey international standards. Some, such as FORTRAN, COBOL, ADA and C, can highlight use of non-standard code on request, making them ideal candidates for use in any multi-vendor environment.

4) Any VMS application fatal runtime error is given in English, including detail relating to the call hierarchy at point of failure. Faster time to fix.

5) All VMS languages use the standard RMS file system, so files are immediately usable whatever language you use. Where a language does not have standard Relational Database SQL or Rdb precompilers, all the same facilities are available using the standard VMS call interface.

Digital provides the best development environment in the industry, and the products you're about to see are the components of this success story— for Digital and its customers.

DECdesign

GRAPHICAL DESIGN OF SOFTWARE SYSTEMS

DECdesign supports the analysis and design phases of software development with industry accepted graphical techniques. This will be extended over time to provide a Digital-developed graphics environment for analysing, designing, prototyping and automatically generating large and complex applications. Until then, V1.0 delivers:

- DECwindows User Interface.
- DDIF support, allowing design diagrams to be imported into other CDA™ compliant applications such as DECwrite.
- Supports Yourdon and Extended Entity Relationship (EER) techniques with Ward Mellor extensions to Yourdon for Realtime work.
- Supports a single DECdesign database, and integrates with the VAX CDD/PLUS Common Data Dictionary.
- Provides hardcopy reports of the analysis and design effort through predefined report templates.
- Supports large or small distributed development teams.

DECdesign is based on an open, object-orientated architecture, allowing it to be tailored to handle specialised needs. In this first release, such customisation requires the involvement of a Digital Software Specialist.

Why use such a tool?

Graphically-based analysis and design tools describe an application under development in much the same way that blueprints describe a building under construction. While there are different views or models (for example, Plumbers, Electricians, Bricklayers, Carpenters, etc) of the building under construction, all are required to complete the end result. Such perspectives are best expressed graphically, where a picture is indeed worth a thousand words.

DECdesign is designed to take into account that there is no single standard process, data or implementation modelling method; in fact, there are over 300 different techniques (and we're still counting) being used to some extent. Until this stabilises, DECdesign gives the flexibility to support many existing, and future, analysis and design methods and their local customisation.

The benefit of a CASE tool like DECdesign V1.0 is the ability to create, modify and re-use the results of the analysis and design phases. This should result in a more cost-effective development effort as well as reducing the cost of ongoing maintenance.

Popular techniques

DECdesign provides three common graphic analysis and design techniques, namely Yourdon, Extended Entity Relationship (EER) and Ward Mellor extensions to Yourdon. DECdesign supports the analysis and design effort by automatically checking for syntactical and semantic design errors (this is largely dependent upon a particular techniques' customisation).

DECdesign report templates supply hardcopy reports of the results in line with the methodology used. Digital's Software Services can customise these templates in line with specific reporting needs.

Part of the Big Picture

As a DECwindows-based product that supports Digital's Compound Document Architecture, diagrams and associated design information can be transferred into other CDA™ conformant applications. The DECwrite compound editor is one such product, allowing personnel to document their projects with a minimum of duplicated effort.

Integrated with the CDD/PLUS Repository

DECdesign is integrated with the VAX CDD/PLUS Data Dictionary, allowing data definitions to be re-used throughout the development lifecycle from one consistent, up-to-date location. Storage of analysis and design information in such a central location helps the maintenance and re-use of your investment in designs.

DECdesign can be configured to use a CDD/PLUS dictionary operating on a different machine, eliminating the need to configure every DECwindows VAXstation with a local copy of the data dictionary. This networked server/client approach allows all the members of a project team to have immediate access to all the latest designs, and design changes, in their development project.

Training

A Lecture/Lab Course — *System Analysis and Design with DECdesign* — course number EY-A928E-L0, is available from Digital Educational Services. For details of this and related courses to help make the most from your Digital Software Products, please contact them on (0734) 869766.

Complementary Products

Digital also sells two products from Systematica Software Engineering that are complementary to the DECdesign product. They are SSADM-SF and HOOD-SF.

The Structured Systems Analysis and Design Method (SSADM) is an extensive set of techniques and guidelines for the specification of automated systems. SSADM, which is mandatory for all UK public service applications, is fully supported by the SSADM Software Factory (SSADM-SF) product. SSADM-SF runs under DECwindows and is validated to the CCTA 3-star rating.

HOOD is a method of architectural design particularly suited to systems implemented in the Ada programming language. HOOD-SF is a CASE workbench offering full support of the HOOD (Hierarchical Object Design) Method.

Prices for both SSADM-SF and HOOD-SF are documented in the Index by Operating System.

DECdesign V1.0	SPD 25.29
LICENCE	QL-YFDA9-QB
MEDIA	QA-YFDAA-H5

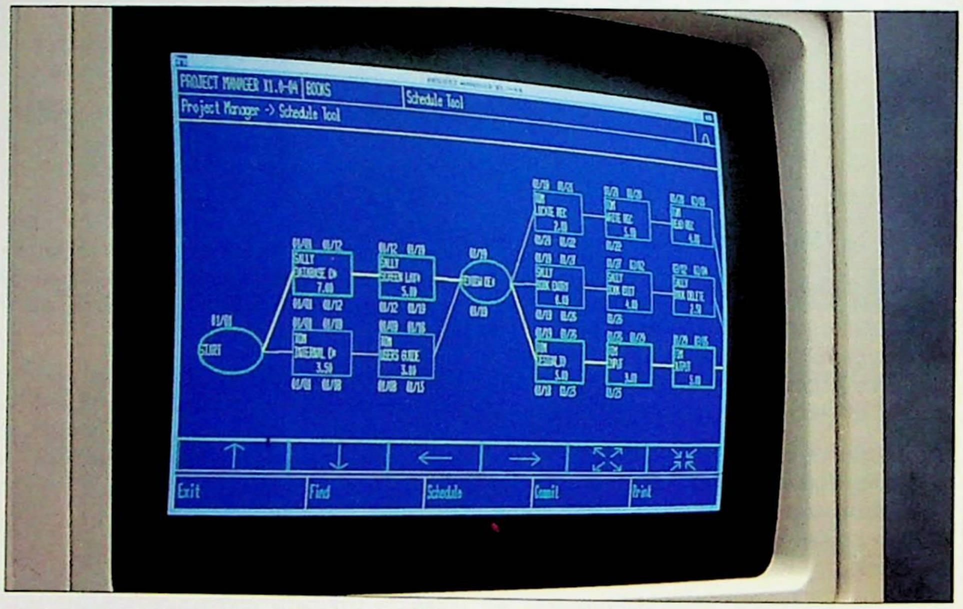
Hardware Requirements: VMS VAXstation with 12Mb system memory (9Mb if connected to a larger VMS host).

Software Requirements: VMS V5.3 or later with DECwindows. CDD/PLUS must be installed to use DECdesign, though this should be on a single, networked machine if the support of multiple VAXstations is required. Organisations that use CDD/PLUS already should not have to purchase another copy to support DECdesign.

VAX Software Project Manager

ESTIMATING, PLANNING AND CONTROL

- Offers project planning based on a Work Breakdown Structure (WBS); projects are represented in a tree structure.
- Identification of crucial tasks using the Critical Path Method.
- Choice of graphical menu or command line interfaces.
- Cost Estimation based on Boehm's COCOMO method of determining overall project costs.
- Single database for the entire project, with tools that allow team members to concurrently report progress—hence freeing project managers from data collection and admin tasks.
- Wide variety of reports and charts, including GANTT, PERT, WBS drawings and Resource Loading graphs.
- User-definable reports.
- Graphics supported under DECwindows Terminal emulator and VT300 series terminals.



VAX Software Project Manager is a tool for planning and managing software development projects. Think about software project management: planning the project, assessing its scope and complexity, identifying tasks and resources. Creating schedules, budgets and staffing plans. Identifying risks. Estimating timeframes. And then controlling events: tracking progress, adjusting schedules, reassigning resources.

You need a tool that can collect all this information and then use it to calculate project costs, schedules, resource needs and dependencies. You deserve a tool that can accomplish all this automatically, working on the same VAX system as project team. VAX Software Project Manager is that tool.

Planning and implementation stages

VAX Software Project Manager is designed to assist in the planning and implementation stages of any medium to large software development project.

During the planning stage, VAX Software Project Manager helps you define schedules, staffing and other resource requirements, including project costs and duration. 'What If' analyses automatically let you make intelligent trade-offs, if required.

During implementation stage, VAX Software Project Manager gathers status and progress data from individual team members and compares this data to planned progress. Using the Critical Path Method, it identifies crucial risks and dependencies, and generates reports and graphs that represent progress and status information in an easy to read format.

Estimation

To give real meaning to your project management efforts, VAX Software Project Manager includes estimation tools that calculate project costs on the basis of the COCOMO (COst COnstructive MOdel) cost driven developed by Dr. Barry Boehm (Software Engineering Economics, NJ: Prentice Hall, 1981). Boehm's technique for estimating software development costs has received widespread acceptance in the industry.

Planning

VAX Software Project Manager's planning capability includes several tools designed to give project leaders and managers a fast way of pulling together information on project tasks, resources and schedules. This information goes into the project database and serves as data to be used by the other facilities.

The fundamental planning tool is the Work Breakdown Structure (WBS), which specifies each and every task to be performed on a project. This information will be crucial when VAX Software Project Manager performs estimates of effort, time and costs. And to give you a clear picture of the project's scope and its task dependencies, the WBS creates a tree-structured representation of all project tasks. Other planning facilities include precedence network tool, GANTT and bar charts.

Control

VAX Software Project Manager's project control tools let you compare progress made against plan at the overall project level and at individual contributor level. One tool lets team members input data on actual progress made; another lets them view charts comparing current status to planned progress; a third tool creates graphic displays and reports of project data.

User Interface

VAX Software Project Manager offers two user interfaces: one is a menu driven, graphical interface for use on VAXstations and graphics terminals; the other is a traditional command-line interface. The graphical interface is especially easy to use and is easily learned. The command line interface permits conciseness, and works in batch or interactive mode.

VAX Software Project Manager V1.2											SPD 27.52						
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 5300 blocks (2713 Kb) **Operation:** 5300 blocks (2713Kb).

MEDIA	TK50 **5** Tape **M**

LICENCE	QL-A82A9-J	MEDIA	QA-A82AA-H
DOCS	QA-A82AA-GZ		

VAX TDMS

NEW VERSION 1.9A

VAX TDMS & VAX TDMS Runtime

CDD INTEGRATED FORMS SOFTWARE

VAX TDMS (Terminal Data Management System) is designed for the implementation of interactive, forms-intensive applications running on VAX systems. VAX TDMS can reduce the application development and maintenance effort by replacing application program terminal logic with external TDMS definitions. VAX TDMS provides:

- A Screen Editor to define forms.
- A non-procedural language to define the exchange of data between an application program and its associated terminal.
- The ability to read record definitions in the Common Data Dictionary for VAX Datatrieve, VAX DBMS Codasyl and VAX Rdb Relational Databases.
- Utilities that enable the creation, modification, and storage of form definitions and request definitions in the VAX Common Data Dictionary.

VAX TDMS V1.9A															SPD 25.71		
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX CDD/PLUS. **Installation:** 12,000 blocks (6.1 Mb). **Operation:** 5,000 blocks (2.5Mb) with sample programs, 2,500 blocks (1.2Mb) without.

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-706A9-J	MEDIA	QA-706AA-H
DOCS	QA-706AA-GZ		

VAX TDMS Runtime V1.9A															SPD 25.71		
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX CDD/PLUS. **Installation:** 3,000blocks (1.5Mb). **Operation:** 500 blocks (0.2Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-711A9-J	MEDIA	QA-711AA-H
DOCS	QA-711AA-GZ		

VAX FMS

TRADITIONAL FORMS ENVIRONMENT

VAX FMS is designed to assist in the development of application programs that use video forms on a variety of terminals.

- An interactive forms editor plus a forms translator (used if offline preparation of forms is preferred).
- A librarian to maintain forms libraries.
- A test facility to display a form as an application user would, to type data into fields and to display field help.

When used in conjunction with the DECnet/SNA VMS Distributed Host Command Facility (DHCF), VAX FMS can be used, with restrictions, with any IBM 3270 compatible terminal supported by DHCF.

VAX FMS Forms Driver

The Forms Driver is the runtime component of VAX FMS. It allows FMS forms to be migrated to any other VMS computer, without the need to purchase the full development environment.

VAX FMS V2.4															SPD 26.10		
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 3,000 blocks (1,536 Kb). **Operation:** 2,650 blocks (1,357 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-VD7A9-J	MEDIA	QA-VD7AA-H
DOCS	QA-VD7AA-GZ		

VAX FMS Forms Driver V2.4															SPD 26.10		
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 350 blocks (180 Kb). **Operation:** 300 blocks (154 Kb).

	TK50 **5** Tape **M**
MEDIA	

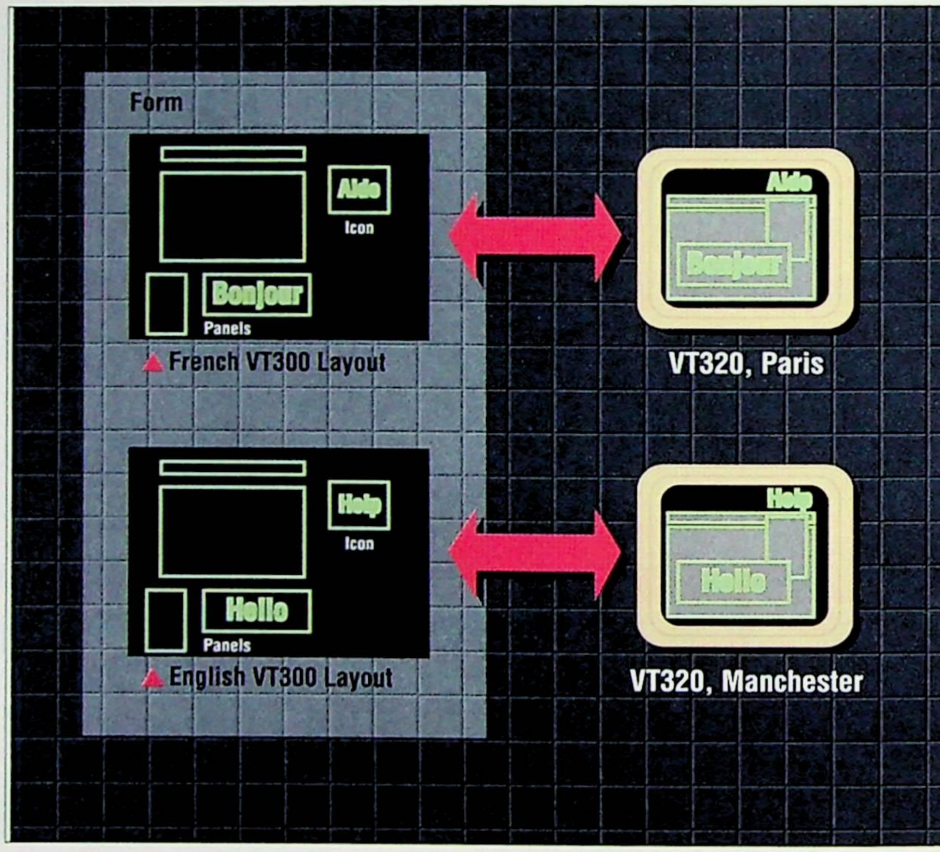
LICENCE	QL-VD8A9-J	MEDIA	QA-VD8AA-H
DOCS	QA-VD8AA-GZ		

DECforms

THE NEXT GENERATION IN FORMS TECHNOLOGY

DECforms is Digital's single forms solution for the 1990s. Based on the proposed ANSI-and ISO-standard Form Interface Management System, DECforms combines in a single product all the best features of VAX FMS and VAX TDMS. It also offers a host of powerful new features, with an extensible architecture that will allow it to meet changing user-interface requirements and environments.

- Offers powerful new capabilities never before available in a Digital forms product.
- Uses its own built-in windowing environment to display and manage multiple, overlapping form panels, simultaneously, anywhere on the screen.
- Combines simple record-level program interface calls with powerful field-level processing capabilities isolated within the form.
- Enables efficient and powerful distributed forms processing in ACMS-based OLTP environments.
- Provides a robust, WYSIWYG form-development environment.



The unique DECforms architecture allows a single application to use a single form to multiple end-user environments.

First with ANSI/ISO Standard FIMS.
DECforms is the industry's first implementation of the CODASYL Form Interface Management System (FIMS), a proposed national and international standard defined by an ANSI/ISO-accredited CODASYL committee. FIMS defines the model and supporting language for a standard interactive application form interface that offers device- and language-independence, efficient distribution, ease of use, and control flexibility.

The best of VAX FMS and VAX TDMS.
VAX FMS and VAX TDMS each offer a different set of capabilities with unique advantages: the dilemma is that users often require a mixture of these capabilities. DECforms solves the problem by bringing together all the key features of VAX FMS and VAX TDMS into a single, cohesive forms environment.

... plus a robust set of new capabilities.
DECforms offers a host of additional capabilities that make forms-based applications more powerful, more efficient, and easier to develop, maintain, and use.

- Conforms to an industry-standard, full windowing interface; provides a DECwindows look/feel within the hardware bounds of a character-cell terminal.
- Allows a single form to be tailored for multiple environments; permits large forms of multiple pages.
- Provides in-the-form validations; scrolling regions of partial lines; supports icons, international dates and colour forms.

Advanced window management.
With DECforms, panels are displayed on the screen in viewports (windows) which can be located anywhere on the screen. DECforms provides a complete windowing system to manage these viewports. Multiple viewports can exist simultaneously on the screen in any configuration (occluding one another). DECforms automatically displays and removes viewports with their associated panels as required by the application program.

No more form processing
DECforms removes front-end processing from the application and isolates it in the form itself. It employs an Independent Form Description Language (IFDL) which features both declarational and procedural constructs. Field-level control, screen navigation, panel management, and cross-field and relational validations can be performed without returning to the application program.

A foundation for the future
DECforms initially supports the full range of VT-series terminals and compatible emulators of PCs and DECwindows-based workstations. As new devices are introduced and supported, applications which use DECforms can take advantage of the new technologies with essentially no changes in application program code. Form designers need simply update existing forms to contain an additional layout tailored for a new device.

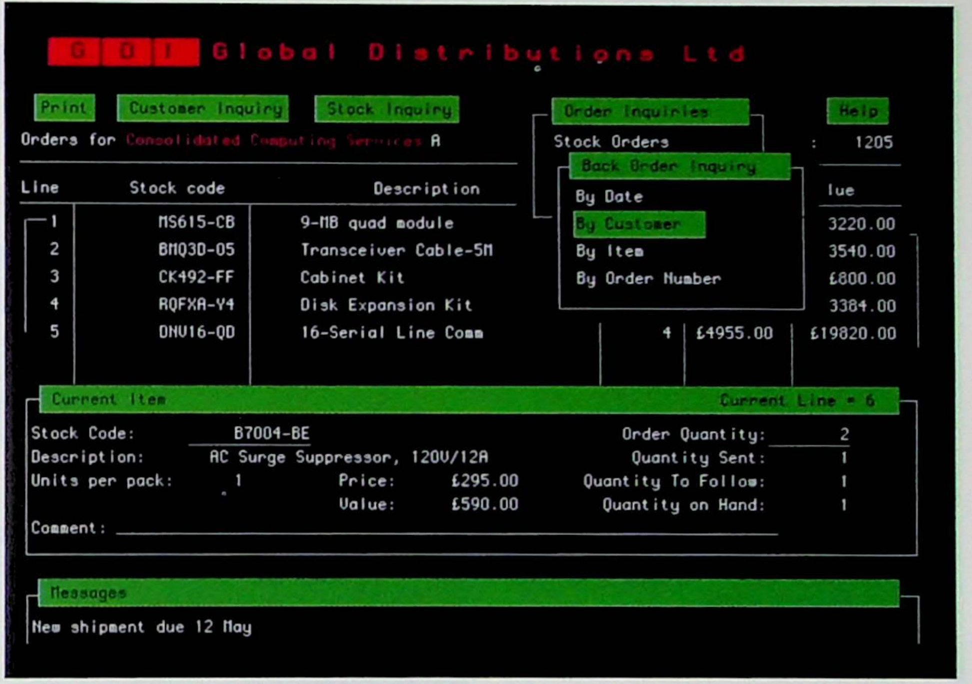
DECforms was designed with performance-sensitive On-Line Transaction Processing (OLTP) environments in mind. An integral interface to VAX ACMS allows DECforms to serve as a powerful front-end for either distributed or centralised OLTP applications.

NEW VERSION 1.2

Moving from FMS and TDMS to DECforms

DECforms coexists with both VAX FMS and VAX TDMS. Hence, applications which currently use VAX FMS or VAX TDMS can include calls to DECforms without the need for rewriting existing modules. DECforms also includes utilities for converting VAX FMS forms and VAX TDMS forms and requests into DECforms constructs.

Digital is committed to helping customers to take advantage of the new features and growth potential of DECforms. Current licensed users of either VAX FMS or VAX TDMS are eligible to purchase special DECforms migration licences at reduced prices.



DECforms uses its own built-in windowing environment to display and manage multiple, overlapping form panels, simultaneously, anywhere on the screen.

DECforms Development V1.2 SPD 29.90

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0 or later. **Complementary Software:** VAX ACMS V3.1 or later is required for distributed or centralised TP forms processing. **Installation:** 23,750 blocks (12.0Mb). **Operation:** 15,000 blocks (7.7Mb) with samples, 7,500 blocks (3.9Mb) without.

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VCHA9-J**	MEDIA	**QA-VCHAA-H**
DOCS	**QA-VCHAA-GZ**		

DECforms Runtime V1.2 SPD 29.90

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0 or later. DECforms Runtime is the product required if you use the ACMS CP Process as a front-end TP forms processor on another VAX. **Installation:** 2,100 blocks(1.1Mb). 1,000 blocks (0.6Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VNSA9-J**	MEDIA	**QA-VNSAA-H**
DOCS	**QA-VNSAA-GZ**		

DECforms Development Migration from FMS/TDMS Development V1.2 SPD 29.90

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. Disk space requirements are identical to those of DECforms Development.

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VUVA9-J**	MEDIA	**QA-VCHAA-H**
DOCS	**QA-VCHAA-GZ**		

DECforms Runtime Migration from FMS/TDMS Runtime V1.2 SPD 29.90

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. Disk space requirements are identical to those of DECforms Runtime.

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VUWA9-J**	MEDIA	**QA-VNSAA-H**
DOCS	**QA-VNSAA-GZ**		

DEC VUIT

NEW PRODUCT

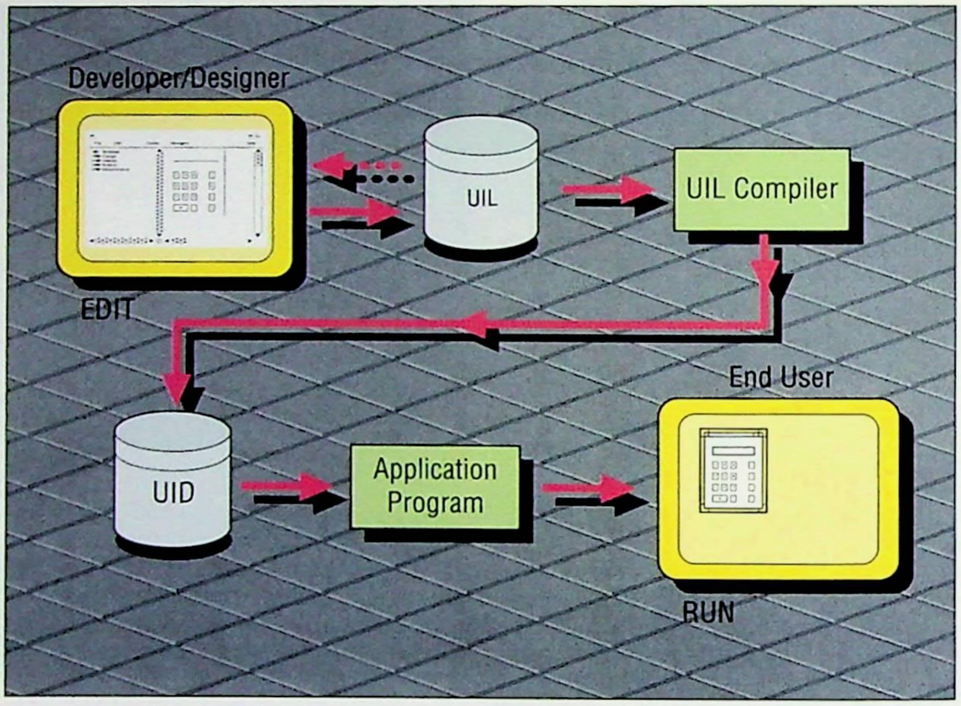
OSF/MOTIF USER INTERFACE CREATION TOOL

DEC VUIT is intended to increase programmer productivity during the development of DECwindows application interfaces. Running under VMS or ULTRIX, DEC VUIT offers the ability:

- To create DECwindows-conforming applications graphically.
- To design and prototype rapidly, using a WYSIWYG editor.
- To separate form from function, which speeds development.

User interface programming is typically 50% of the code in an application, but it takes up to 90% of the programmer's time. Programmers and designers need more time to design, prototype, and build applications and interfaces that meet the needs of the user environment, with less time spent coding. Digital's visual user interface design tool provides the solution needed to create DECwindows applications more quickly and easily than with conventional coding techniques.

DEC VUIT is designed to fill the needs of software developers for developing graphical interfaces for a variety of applications, and creating XUI-compliant user interfaces according to the DECwindows standards.



DEC VUIT increases productivity during the development of DECwindows applications.

Major Functionality

DEC VUIT is an interactive editor for constructing DECwindows interfaces comprised of DECwindows Toolkit widgets. Just as in User Interface Language (UIL), the DEC VUIT allows users to specify the form of their application interface separately from its function. In contrast to UIL, which employs a language-based declarative specification of the user interface definition, the DEC VUIT possesses a what-you-see-is-what-you-get (WYSIWYG) style interface.

Interfaces generated conform to the XUI style guide, and also provide a simulation capability to allow users to view their prototype without worrying about the technical bindings of the interface to the "function".

DEC VUIT is designed primarily for software developers. A key assumption is that users are familiar with developing DECwindows applications and have some familiarity with the User Interface Language.

The prototyping capability in DEC VUIT can be used and implemented by non-technical professionals; however, it is assumed a higher level of abstraction is needed for the designing audience over the longer term.

DEC VUIT for VMS

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

	TK50 5	Tape M
MEDIA		

LICENCE		MEDIA	
DOCS			

DEC VUIT for ULTRIX/RISC

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 5	Tape M
MEDIA		

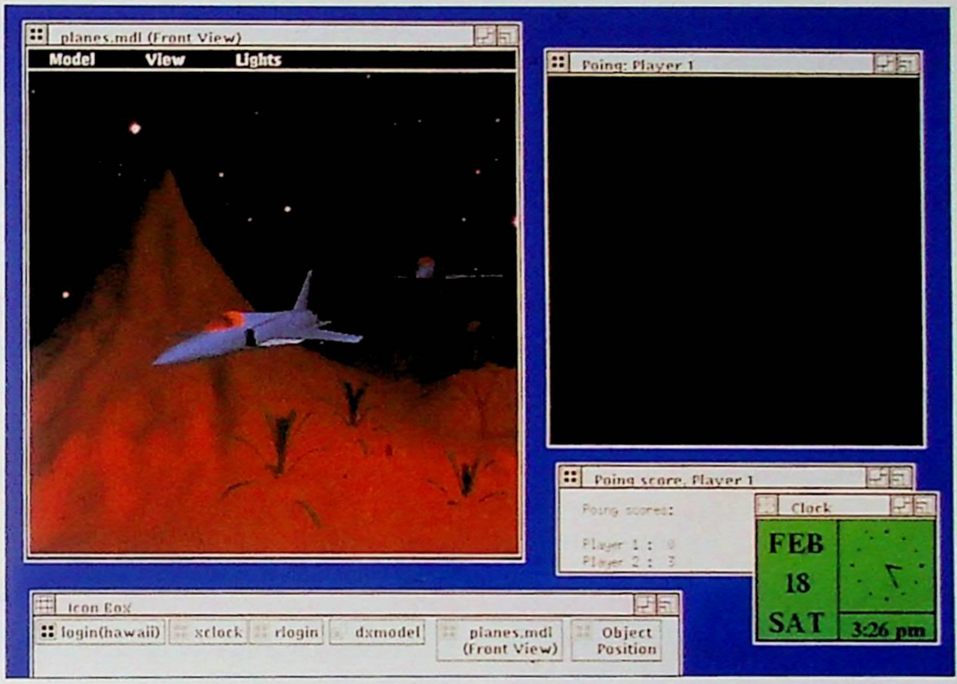
LICENCE		MEDIA	
DOCS			

DEC PHIGS, DEC GKS, DEC GKS-3D

TRUE PORTABILITY FOR GRAPHICS APPLICATIONS

DEC PHIGS (Programmer's Hierarchical Interactive Graphics System) and DEC GKS/GKS-3D (Graphical Kernel System) are Digital's graphics software products based on international standards.

- New! ULTRIX/RISC version of DEC PHIGS.
- Application portability by adhering to industry standards.
- Device independence, making it possible to run graphics applications on a wide range of output devices without modifying the source code.
- Increased development efficiency, by reducing the cost of training. Programmers trained to use PHIGS or GKS don't need to be retrained when new or different graphics hardware is used.
- Network-transparent graphics, enabling your application to access the power and resources of other networked computers. Two-dimensional support is based on DECwindows (X-11). 3-dimensional support is based on PEX.



DEC PHIGS, GKS and GKS-3D give device-independent graphics capabilities to your applications.

As an integral part of Digital's computing environment, DEC PHIGS and DEC GKS support other industry and Digital standards and architectures, including CDA (Compound Document Architecture) through the Digital Document Interchange Format (DDIF).

Implementing standards

DEC PHIGS is a 3-dimensional graphics subroutine library that controls the definition, modification, and display of hierarchical graphics data. DEC PHIGS is packaged as a set of shareable images, and is based on the 1988 PHIGS standard (ANSI X3.144-1988 and ISO 9592-1:1988(E)) for 3-dimensional, device independent graphics.

DEC GKS is a subroutine library which implements the ISO (IS 7942) and ANSI (ANS X3.124-1985) GKS standard for two-dimensional device-independent graphics. DEC GKS conforms to level 2c of the GKS standard which provides full output capabilities, including workstation-independent segment storage (level 2), and full input capabilities (synchronous and asynchronous input (level C)).

DEC GKS-3D is Digital's implementation of the ISO standard (ISO 8805:1988(e)). It is an upwards-compatible extension of the existing, 2-dimensional GKS ISO standard. It includes all GKS functionality and adds 3-dimensional definitions and viewing.

PHIGS: The best 3D graphics environment

PHIGS is a sophisticated, 3-dimensional graphics support system that controls the definition, modification, and display of hierarchical graphics data. DEC PHIGS incorporates the functionality of both PHIGS and PHIGS+.

DEC PHIGS offers a variety of primitives to create graphic elements. The appearance of these graphic elements is controlled by assigning attributes such as line weight, colour, or character font. The extended functionality in DEC PHIGS means application software does not need to generate complex graphics; this frees you to concentrate on developing your application.

GKS: Complete 2D graphics functionality

DEC GKS offers the graphics application developer a rich set of graphics functions. It implements the GKS standard at level 2c (the highest level specified), making it the most powerful 2D graphics interface available to Digital's users today. DEC GKS accommodates the different input requirements for a wide range of devices so that your application program can receive input from all of them.

GKS-3D: 3D extensions to GKS

DEC GKS-3D is a graphics system for use by applications that need to produce three-dimensional images in a way which is either device-independent or system-independent, or both.DEC GKS-3D is complementary to the GKS system. It provides the GKS user with an upwards-compatible three-dimensional system and a superset of GKS functionality. (GKS is mainly used for 2D applications in such areas as technical drawing, mapping, charts and graphs.)

PHIGS vs. DEC GKS-3D

DEC GKS-3D is complementary to PHIGS. The two standards address different 3D graphics applications. GKS-3D is a system suitable for non-structured, fixed 3D images, while PHIGS handles structured 3D graphics data that can be edited and modelled.

DEC PHIGS, DEC GKS, DEC GKS-3D *(continued)*

DEC PHIGS for VMS V2.1

SPD 29.38

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 17,000 blocks (8.7Mb) **Operation:** 16,000 blocks (8.2Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE **QL-OKBA9-J** MEDIA **QA-OKBAA-H**
DOCS **QA-OKBAA-GZ**

DEC PHIGS Runtime for VMS V2.1

SPD 29.38

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 11,200 blocks (5.7Mb) **Operation:** 10,700 blocks (5.5Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE **QL-VK1A9-J** MEDIA **QA-VK1AA-H**
DOCS **QA-VK1AA-GZ**

DEC GKS for VMS V4.1

SPD 26.20

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 10,300 blocks (5.3Mb). **Operation:** 9,600 blocks (4.9Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE **QL-810A9-J** MEDIA **QA-810AA-H**
DOCS **QA-810AA-GZ**

DEC GKS Runtime for VMS V4.1

SPD 26.20

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:**5600 blocks (2.9Mb) **Operation:** 5000 blocks (2.6Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE **QL-811A9-J** MEDIA **QA-811AA-H**
DOCS **QA-811AA-GZ**

DEC GKS 3-D for VMS V1.0

SPD 25.D2

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 9,000 blocks (4.61 Mb) **Operation:** 8,000 blocks (4.10 Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE **QL-VFXA9-J** MEDIA **QA-VFXAA-H**
DOCS **QA-VFXAA-GZ**

DEC PHIGS for ULTRIX/RISC V2.1

SPD 25.K7

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 **5** Tape **M**
MEDIA	

LICENCE **QL-VW7A** [ ] **-AA** MEDIA **QA-VW7AA-H**
DOCS **QA-VW7AA-GZ**

Required Software: VAX ULTRIX Operating System.

DEC GKS-3D for ULTRIX/RISC V1.0

SPD 30.93

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 **5** Tape **M**
MEDIA	

LICENCE **QL-VX1A** [ ] **-AA** MEDIA **QA-VX1AA-H**
DOCS **QA-VX1AA-GZ**

Required Software: VAX ULTRIX Operating System. **Installation:** 11,000 Kb. **Operation:** 8,000 Kb.

VAX Ada

HIGH PERFORMANCE PLUS DEPENDABILITY

VAX Ada is Digital's validated implementation of the full ANSI/MIL-STD-1815A-1983 Ada Language standard. The VAX Ada compiler runs under the VMS Operating System and generates optimised, shareable and position-independent code.

- Validated with the Ada Compiler Validation Capability (ACVC) V1.10 over the entire VMS family.
- Comprehensive diagnostic messages, including automatic syntax error correction.
- High-level, fully symbolic debugging capability through the VMS debugger, including support for mixed Ada and non-Ada code, packages and tasking programs.
- Full development, version management, tuning and automated testing support using the optional VAXset products.
- Generic Code Sharing to reduce code size and to encourage the development of efficient, reusable components.
- Many new Program Library Manager features, including the ability to determine compilation order without manual intervention.
- Can target VAX and non-VAX based embedded systems through the use of VAXELN Ada or XD Ada products.
- DECwindows bindings for VAX Ada are provided with VMS V5.1 and later.

As a native mode VMS language, VAX Ada is integrated into the VMS common language environment. All VMS system services and utilities are thus available to programs written in VAX Ada, including the VAX Record Management Services (RMS). VAX Ada programs can invoke modules written in other VMS languages. Programs written in other languages can invoke VAX Ada modules.

Ada extensions

- The ability to handle exceptions from non-Ada code and generate exceptions to be handled by non-Ada code.
- The ability to handle VMS asynchronous system traps (ASTs).
- The ability to link with shared images and use shared global sections.
- The ability to share data with non-Ada code through global variables and psects.
- System-dependent facilities: Different systems vary in such characteristics as size, memory size, and the smallest and largest integer values supported. Ada provides the predefined package SYSTEM to define system-related constants and to represent system-dependent information.

Finally, VAX Ada provides a number of pragmas that allow various system-related parameters to be set and changed.

The Ada Advantage

Strong Typing
An object (variable) of a given type may take on only those values that are appropriate to that type, and only certain predefined operations may be performed to data of that type.

Data Abstraction
Data abstraction ('information hiding') hides implementation details while providing users with mechanisms for using the implementation. Abstraction allows the user to focus on important characteristics while ignoring underlying details.

Concurrent Processing
Most high-order languages provide little or no support for handling parallel or concurrent activities; they rely on facilities of the host operating system. Ada uses tasks to allow parallel activities to be programmed directly within the language.

Separate Compilation
Ada's separate compilation feature allows a programmer to divide a large program into compilation units that may be compiled at different times. When a unit is compiled, the Ada program library manager records information about that unit and other related units. This feature is unlike separate compilation features in other languages, where very little information about separately compiled modules is maintained.

Generic Definitions
A generic unit is a template from which specific instances can be made at compile-time. In many cases, the logic of an algorithm or a set of operations is independent of the specific type of the values being manipulated. However, in a strongly typed language such as Ada, all types must be defined at compile-time. Generic definitions allow the user to define a general algorithm or set of related operations, and then create a specific instance of that algorithm or set of operations for each type to which the algorithm or operations must apply.

Exception Handling
In many operations, especially embedded computer systems, it is critical that a system be able to recover quickly and efficiently from error conditions. Ada provides the ability to raise and handle exceptions. It includes predefined exceptions and also permits the user to define exceptions.

Program Library Manager
The common use of an Ada program library manager, together with the option of shared use of compiled Ada code, provides support for programming teams of any size. Program sub-libraries can be used to isolate, develop, and test Ada units in the context of parent program libraries, with automatic recompilation of any obsolete compilation units.

Dedicated Targets for VAX Ada code

The XD Ada family of products represents a joint effort between SD-Scicon and Digital's VAX Ada compiler and environment team. Based on the VAX Ada compiler front-end and SD-Scicon's code generation technology, XD Ada MC68020 provides comprehensive support for a popular 32-bit realtime target architecture, the Motorola MC68020. XD Ada supports the HP/MRI IEEE-695 format for the export of symbolic information to compliant emulators and simulators.

XD Ada MC68020 is validated with the Ada Compiler Validation Capability (ACVC) V1.10 test suite.

XD Ada MC68020 is fully integrated into the VMS operating system and is compatible with the user interface, tools and documentation of VAX Ada, the VAX Ada Program Library Manager, the VAX/VMS symbolic debugger and VAXset tools. This seamless integration means that the programming team are quickly familiar with the task at hand, making large projects easier to manage. XD Ada MC68020 also produces the same high-quality code as VAX Ada, with industry leading performance.

Further information and pricing detail on XD Ada is available from:

SD-Scicon, Software Technology Centre, Pembroke House, Pembroke Broadway, Camberley, Surrey GU15 3XD. Tel: (0276) 686200 Fax: (0276) 683511.

VAX ADA V2.1 — **SPD 26.60**

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Req. Software: VMS Operating System. **Comp. Software:** VAXset or its components (note functionality of MMS already present in VAX Ada) for development. VAX DOCUMENT (electronic publishing system support for DOD- STD-2167A documents). VAXELN Ada (for dedicated realtime VAX targets). **Installation:** 38,000 blocks (19.5 Mb). **Operation:** 37,000 blocks (19.0 Mb).

	TK50 **5** Tape **M**
MEDIA	

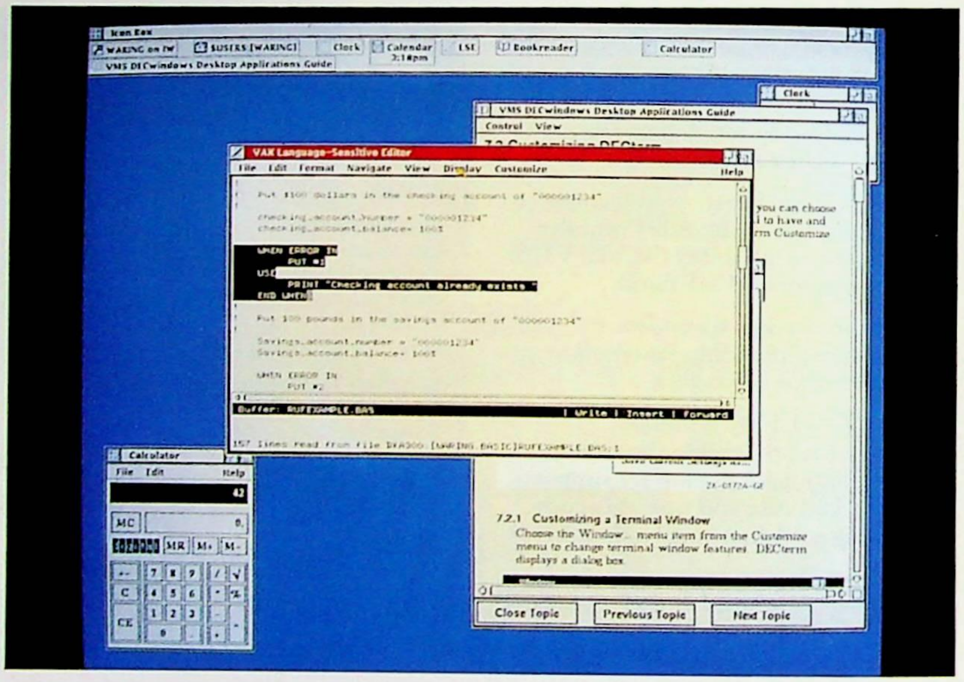
LICENCE	**QL-056A9-J**	MEDIA	**QA-056AA-H**
DOCS	**QA-056AA-GZ**		

VAX BASIC

FAST, FRIENDLY AND POWERFUL

VAX BASIC is a language which can be used both interactively and as a powerful development language for compiled systems; it is also fully integrated into the VMS development and database environments.

- Interpreter and compiler generating relocatable, position independent code that runs on any VMS system.
- Language elements for structured programming.
- Inbuilt graphics commands when used in conjunction with VAX GKS or VAX GKS Runtime.
- User-definable data types.
- Support for all VAX RMS (Record Management Services) functions on sequential, relative and index sequential files, with the ability to call the standard SORT package provided with VMS.
- Inbuilt Rdb relational database precompiler.
- Supported by the VAX LSE language-sensitive editor and the rest of Digital's VMS VAXset development environment.



VAX BASIC programmers can make use of Digital's VMS programming tools such as VAX LSE.

VAX BASIC can be used as an interpreter or as a compiler. In both cases it produces very fast programs. It is a much enhanced implementation of BASIC, providing a large number of mathematical and string-handling functions, with full support for the VAX RMS file system. Utilities such as VAX SORT, operating system services and even procedures written in other VAX languages can be called directly.

The VAX BASIC compiler produces re-entrant code which makes use of the built-in trouble-shooting capability of the VMS system to trace errors. Detailed error descriptions, trace information and on-line help make VAX BASIC a productive environment for program development.

Block Structure

Special support for structured programming elevates VAX BASIC almost to the ranks of a block-structured language (such as Pascal) and allows a lucid programming style, even with complex tasks. IF blocks (IF–THEN–ELSE–END) and SELECT blocks (SELECT–CASE–END), variable names up to 31 characters long, and the omission of line numbers all serve to increase program legibility. Naturally, this also brings cost benefits in terms of program maintenance.

BASIC modules which are created separately can be dynamically linked during execution time.

Fully Integrated

VAX BASIC is fully integrated into the VAX environment and hence is supported by all the VAXset program development tools. VMS procedure libraries and databases can be accessed during execution, and interworking with VAX Information Architecture products is possible.

VAX BASIC allows the use of all VAX architecture data types, including floating point numbers in G and H format, packed decimal numbers and strings. Working with virtual fields is supported, as is access to all organisational forms of the VAX RMS file system

One copy of VAX BASIC is used simultaneously by all users (it is shareable) and when used as a compiler it generates optimised, shareable code which is compatible with the code produced by the other VAX languages.

Graphics

VAX BASIC possesses graphics commands modelled after ANSI BASIC Graphics commands. These are implemented using VAX GKS to provide device-independence.

Graphic output primitives include points, lines, areas and text; graphic input types include points, menu choice, value selection, and text. Other facilities allow the programmer to adjust the range of coordinate values to suit the application, and to specify and retrieve graphic attribute values.

Graphic procedures (PICTURE subprograms) are also provided for building complex objects; transformations can also be applied to these procedures.

VAX BASIC V3.4 SPD 25.36

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Software Requirements: VMS Operating System. **Complementary Software:** VAX Common Data Dictionary/Plus, VAX Language-Sensitive Editor, VAX GKS V2.0 Development or Run-time to enable graphics commands, VAX Source Code Analyzer, VAXset Program Development Environment. **Installation:** 6,800 blocks (3.5Mb). **Operation:** 6,600 blocks (3.4Mb).

MEDIA	TK50 **5** Tape **M**

LICENCE	**QL-095A9-J**	MEDIA	**QA-095AA-H**
DOCS	**QA-095AA-GZ**		

VAX C

HIGH-POWERED PROGRAMMING

VAX C is an extended implementation of the C programming language originally developed at Bell Laboratories. The VAX C compiler runs under the VMS Operating System and generates optimised, shareable and position-independent code. VAX C offers:

- Structured programming, with multiple data types for numeric, non-numeric and local system programming.
- Support for stream format and RMS-ISAM file formats.
- Access to data structures declared using the VAX Common Data Dictionary (VAX CDD/PLUS), plus an inbuilt Rdb relational database precompiler.
- Compiler listing can optionally include a cross reference listing. VAX C also supports the VAX Language Sensitive Editor and VAX Source Code Analyser.
- Interface to VAX DEC/Shell as an alternate command line interpreter under which the VAX C compiler and user programs may be run.
- Extensive global and local optimisations of generated code for increased performance and reduced size under VMS.
- Interface to the CURSES screen manipulation package.
- Can make use of standard VMS symbolic debugging, version management, performance analysis and automated testing tools.

```
main ()
{
     int i;
     for (i=0; i<=4; i=i+1)
          printf ("factorial(%d) =  %d\n",i,factorial (i));
}
int factorial (n)
{
     if (n<=1)
         return 1
     else
         return m*factorial (n-1);
}
[end of file]
 Buffer TEST1.C                                    Insert     Forward
 LSE command> compile/review
```

As a native-mode VAX language, VAX C is integrated into the VAX common language environment. All VAX system services are thus available to programs written in VAX C.

VAX C supports VAX Record Management Services (RMS) in addition to the stream file access conventional among most C implementations. VAX C programs can invoke, as functions, modules written in other VAX languages.

VMS Development Environment support

VAX C supports the LINT-like features of the VAX Source Code Analyser which is used in conjunction with the VAX Language-Sensitive Editor. The combination of using function prototypes and the VAX Source Code Analyser allows the programmer to check for consistent function usage throughout a program environment.

VAX C also generates complete debug and traceback records for use with the VAX Symbolic Debugger. The Debugger allows the C programmer to set breakpoints, examine and modify the contents of user variables, and selectively halt or continue program execution.

Compatibility with other implementations

VAX C represents a more current definition and implementation of the language than is described in the initial guiding document for C, *The C Programming Language**. Some incompatibilities among implementations do, however, exist. In general, many programs written in C for other compilers can be successfully recompiled under VAX C.

The C language has been closely associated with the UNIX® Operating System which itself was largely written in C. Over 150 UNIX-specific routines have thus been included in the run-time library available with the VAX C compiler. Routines selected for inclusion in this library are primarily those for which a reasonable emulation is possible under VMS. Inherent architectural differences between UNIX and VMS necessarily preclude the likelihood of every C program written for a UNIX environment compiling and executing unaltered. Programs exploiting highly machine dependent or UNIX-specific features will require some conversion effort.

Runtime package for C applications

The VAX C Runtime Package is distributed with the VMS Operating System, and provides shareable routines to perform input/output, character and string handling, mathematical computations, memory allocations and emulation of selected UNIX features without the need for a separate runtime licence.

VAX C on VAX ULTRIX systems

When VAX C was first released, the most common request from our users was for a version of this excellent optimising compiler for UNIX systems. All implementations of VAX ULTRIX now ship with the normal UNIX portable C compiler, plus a copy of the VAX C compiler for ULTRIX.

Under VMS, the C Compiler can highlight the use of non-standard features that are unlikely to translate easily to a different operating environment. The VAX C Compiler on ULTRIX is designed primarily for use in the building of end-user applications for VAX ULTRIX platforms. Code written on any single machine runs on any other CPU in the same family.

* *Brian Kernighan and Dennis M. Ritchie, Prentice-Hall, 1978.*

VAX C V3.1 — SPD 25.38

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Complementary Software:** VAX CDD/PLUS Common Data Dictionary, VAX Rdb/VMS Relational Database, VAX LSE Language Sensitive Editor, VAX SCA Source Code Analyzer, VAX DEC/Shell Command Language Interface, VAXset Program Development Tools. **Installation:** 11,500 blocks (5.8 Mb). **Operation:** 9,200 blocks (4.7 Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-015A9-J**	MEDIA	**QA-015AA-H**
DOCS	**QA-015AA-GZ**		

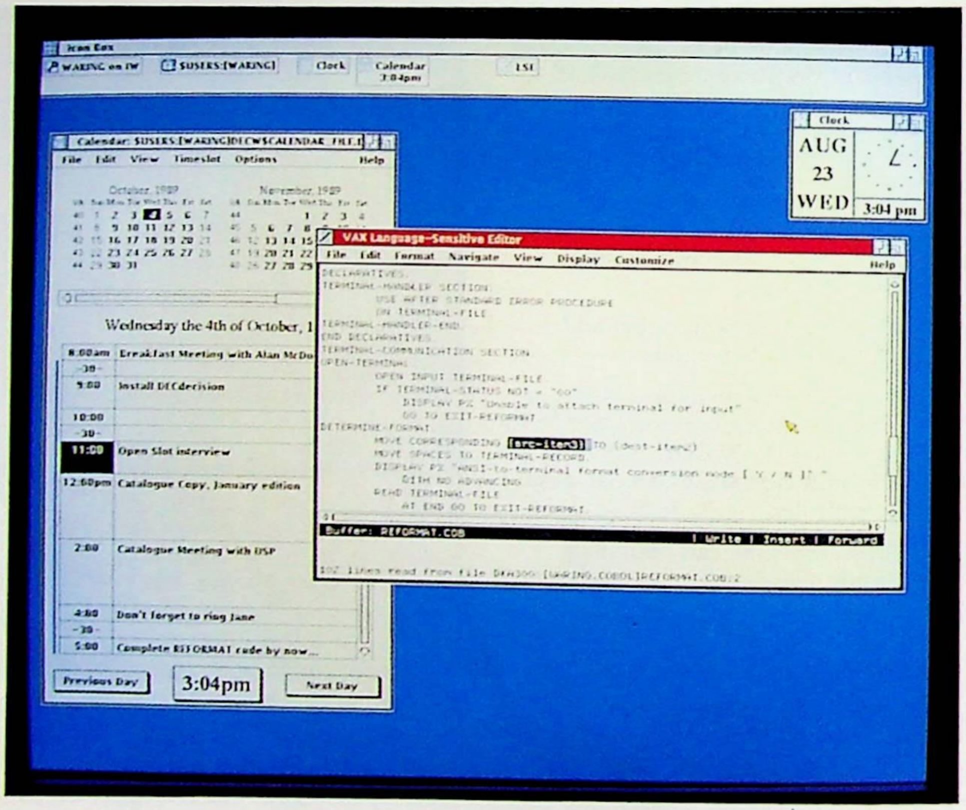
VAX COBOL

NEW VERSION 4.3A

COMMERCIAL DATA PROCESSING LANGUAGE

VAX COBOL is a high-level language for business data processing that operates under the VMS Operating System, taking full advantage of the system facilities and the VAX Information Architecture. It is based upon the 1985 ANSI COBOL Standard X3.23-1985.

- Implements many of the features of forthcoming COBOL standards.
- Support for Data Manipulation Language (DML) pre-processors for accessing VAX DBMS Codasyl and VAX Rdb/VMS Relational Databases.
- Sequential, Relative and Random access support using VAX Record Management Services, allowing access to files created by any other VMS language.
- Ability to call or be called from any other VMS programming language, maintaining your investment in tested code.
- Supported by the VAX Language Sensitive Editor and VAXset V9 with Program Design Facility (PDF).
- New! DECwindows compiler interface.
- Support for the VAX Vertical Forms Printing Utility (VFP) when used with Digital Line Printers.
- Additional performance improvements for VAX 4000 and VAX 6000 series systems.
- New I/O extensions, including descending keys and duplicate primary keys.



Programmers can use workstation-based program development tools to enhance their productivity.

Validated Implementation

VAX COBOL has been validated by the National Bureau of Standards for conformance to 'FIPS PUB 21-2, Federal Standard COBOL' at the high level.

Access to Databases

Two features provide access to the VAX Information Architecture from VAX COBOL. The Data Manipulation Language (DML) allows users to access DBMS databases with VAX DBMS. The COPY FROM DICTIONARY statement, a Digital extension to COBOL, allows access to common record definitions stored in the VAX Common Data Dictionary (CDD).

Digital extensions

- Screen handling is implemented using the DISPLAY and ACCEPT statements.
- File sharing and record locking features enable more than one user to access data at the same time.
- Conditional compilation serves to make debugging easier.

VAX COBOL implements several statements designed to make programming easier in the VMS environment:

- VALUE IS EXTERNAL — Access to link time constants
- USAGE IS POINTER - Address data type
- VALUE IS REFERENCE - Compile time address evaluation
- SET TO REFERENCE - Run-time address evaluation
- SUCCESS/FAILURE - Class conditions

Development aids

The VAX COBOL compiler produces an object module from a source program. The compiler is capable of producing a source listing with embedded diagnostics indicating the line and position of a source-code error, a machine language listing, a file-name map, a data-name map, a procedure-name map, an external program name map, subschema information and a cross-reference listing. The cross-reference listing and maps may be produced in either alphabetical order or in order of declaration. The cross-reference listing distinguishes destructive references to data from read-only references.

Multi-language programming

Object modules produced by the compiler can be linked with other object modules produced by many other languages, including VAX BASIC and VAX FORTRAN. VAX COBOL is supported by both the VAX Common Runtime Library (VAX RTL) and the VAX Symbolic Debugger.

VAX COBOL V4.3A — SPD 25.04

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Complementary Software:** VAX Common Data Dictionary (CDD/PLUS), VAX Rdb Relational Database, VAX DBMS Codasyl Database, DECforms Forms Management, VAX Cobol Generator (4GL), VAXset Program Development Tools. **Installation:** 6,000 blocks (3,072 Kb). **Operation:** 2,000 blocks (1,024Kb).

TK50 5	Tape M
MEDIA	

LICENCE	QL-099A9-J	MEDIA	QA-099AA-H
DOCS	QA-099AA-GZ		

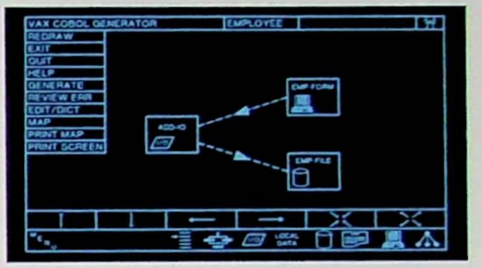
VAX COBOL GENERATOR

DRAW YOUR OWN SOLUTIONS

VAX COBOL GENERATOR offers experienced commercial programmers the ability to produce and maintain applications in a fourth-generation development environment using a reliable, standardised language. It can produce any application which can be created by manual coding and offers, in addition, high-quality VAX COBOL code in a VMS Common Language Environment.

- Automatically generates powerful VAX COBOL source programs.
- Top-down design methodology and graphical interface increase the productivity of commercial programmers.
- Files, fields, forms and report definitions can be shared between several VAX COBOL programs.
- Records the complete work session, protecting against loss of development stages.
- The COBOL Generator's graphical interface represents program elements by special icons.
- VAX COBOL Generator uses a data dictionary (VAX CDD/PLUS) for storage of general data definitions.

In contrast with other COBOL generators, which are no more than libraries of the COBOL modules and subroutines used most frequently by programmers, VAX COBOL Generator permits generation and back-up even at design level.



The design is always up-to-date because it is identical to the program.

Applications generated using the VAX COBOL Generator are simpler to adapt, because comments specified in any part of the application are inserted in the corresponding COBOL source of the program which is produced.

VAX COBOL GENERATOR V1.3																	SPD 27.16
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX COBOL Compiler
Installation: 5,500 blocks (2,816 Kb) **Operation:** 4,600 blocks (2,355 Kb).

	TK50 5 Tape M
MEDIA	

LICENCE	QL-365A9-J	MEDIA	QA-365AA-H
DOCS	QA-365AA-GZ		

Micro Focus COBOL/2

NEW PRODUCT

UNIX BASED COBOL COMPILER

Micro Focus COBOL/2 is a powerful mainframe-level COBOL compiler that allows applications to take full advantage of Digital's 32-bit RISC architecture. Running under ULTRIX/RISC, COBOL/2 provides:

- ANSI Standard '85 and '74 COBOL (High), with IBM COBOL/2, OS/VS COBOL, VS COBOL II, Data General Interactive COBOL and RM/COBOL compatibility.
- Multi-user file handling, with the ability to access an external relational database.
- Generates fast, native code that takes full advantage of ULTRIX/RISC 32-bit addressing.
- Includes Native Code Generator and 'Animator' debugging tool.
- Permits execution-time mapping of filenames.

COBOL/2 is designed to work in conjunction with the Forms/2 subsystem and the Micro Focus COBOL/2 runtime libraries to produce applications portable to a wide range of hardware platforms. Its compatibility with a number of popular COBOL compilers makes it an ideal implementation tool for software developers from a variety of backgrounds.

Compiled applications will work on the complete range of DECstation and DECsystem RISC platforms without recourse to recompilation or rebuilding.

Please note: runtime licences are also available — part numbers at rear of catalogue.

Micro Focus COBOL/2 V1.0																						SPD 33.27
TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: Ultrix Risc. Runtime licenses are also available for this product.

	TK50 5 Tape M
MEDIA	

LICENCE	QB-YNJA -T5	MEDIA	Not required.
DOCS	QA-YNJAB-GZ		

FORTRAN Compilers

THE INDUSTRY STANDARDS

VAX FORTRAN, VAX FORTRAN/ULTRIX and FORTRAN for RISC are the benchmark industry-standard implementations of the FORTRAN language in their respective environments. Key features include:

- VMS FORTRAN High Performance Option to capitalise on the outstanding performance of the new VAX Vector Hardware, and to provide automatic decomposition of applications for Multiprocessor VAX systems.
- Validated against ANSI X3.9-1978, FIPS-69 Federal standard FORTRAN and ISO 1539-1980(E) FORTRAN standards.
- VAX FORTRAN provides directed decomposition, allowing a single program to be split among processors in multi-CPU VAX configurations with symbolic debugger support. Automatic decomposition is an added cost item (see High Performance Option).
- Local and global optimisation of object code to maximise performance.
- Provides symbol table information for each native environment: VMS symbolic debugger or ULTRIX dbx.
- Compiler switches to highlight code syntax unique to Digital FORTRAN extensions.

FORTRAN is the classic high-level programming language for technical and scientific applications. VAX FORTRAN programs can call modules written in other VAX programming languages; they can also access all system services.

Digital FORTRAN compilers generate re-entrant, shareable code. They also possess multi-phase optimisers which perform optimisation across the entire program unit.

VMS Parallel Processing capability

Multi-processor VAX systems are required for proper execution of decomposed DO-LOOPs. However, applications that are compiled using the VAX FORTRAN parallel processing options will run on all VAX processors.

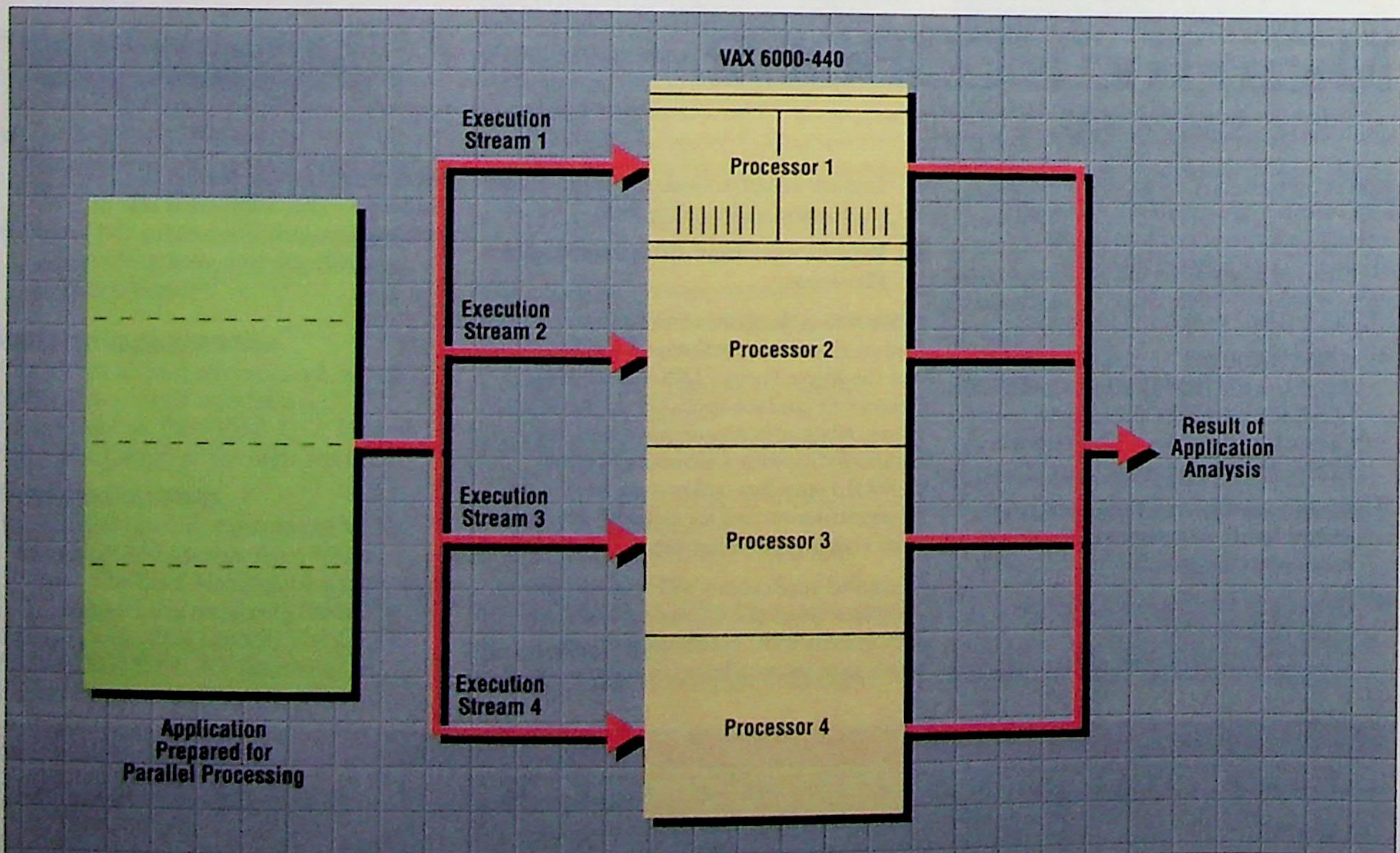
VMS High Performance Option

In order to use the new VAX Vector Hardware, you need to purchase the VMS FORTRAN compiler V6.0 plus the VAX FORTRAN High Performance Option (HPO). HPO supports the automatic vectorisation of applications, and also supports the automatic decomposition of applications for use on Multiprocessor VAX systems (with or without vectors). Only one new language statement (ASSERT) has been added.

The FORTRAN Compiler with the HPO option active will automatically perform vectorisation and decomposition analyses of the source code, and ask for hints from the programmer (through the Language Sensitive Editor) only when an assertion would help further. For example...

```
CDEC$   ASSERT (K .GE. 0)
```

...tells the compiler that the variable K will never be negative at this place in the program. Using this assertion, the compiler may be able to safely vectorise a loop that it would otherwise not have been able to without this additional information. Note that source code compatibility is preserved, as other compilers will parse such statements as comments. If desired, the compiler can enable runtime checking of the ASSERT statements being correct.



At runtime, VAX FORTRAN applications can process execution streams in parallel. The number of processors to be utilised in this case is four. Parallel applications can run on any target VAX system, and can be debugged using the VAX Symbolic debugger.

NEW VERSIONS

VAX FORTRAN, VAX FORTRAN/ULTRIX & ULTRIX/RISC FORTRAN

Assert hints are the only changes that need be made. There is no need to analyse the source program or to tell the compiler what to vectorise, removing a time-consuming and error-prone process.

While Vector and Multiprocessor applications will run on all VAX systems, there is no benefit executing a vector application on a non-vectored CPU (5-7 times slower than re-compiling without the /VECTOR command qualifier).

Use of VAX LSE is mandatory and VAX PCA is recommended with the VAX FORTRAN High Performance Option.

VAX FORTRAN under VMS

With development software such as the VAX LSE language-sensitive editor and the VAX SCA source code analyser, the FORTRAN programmer has powerful tools for generating program code. You also have an extensive choice of version management, performance coverage and automated testing tools; see the description of VAXset for further details.

VAX FORTRAN/ULTRIX under ULTRIX

VAX FORTRAN/ULTRIX supports all the procedures and library functions under ULTRIX-32, as well as procedures which are written in other ULTRIX-32 languages such as C, PASCAL and FORTRAN-77. The compiler generates symbol tables for the ULTRIX debugger, dbx.

Programs which are written in VAX FORTRAN can also be translated by ULTRIX implementations, but there are certain restrictions and differences between VMS and ULTRIX in file structures and name declarations. The input/output functions of VAX FORTRAN/ULTRIX and ULTRIX/RISC constitute a subset of the services offered by VAX FORTRAN under VMS.

FORTRAN for RISC V2.0

FORTRAN for RISC is a full language FORTRAN-77 implementation that complies with the American National Standard for FORTRAN, ANSI X3.9-1978. It has been engineered to make use of the outstanding floating-point performance built into all Digital RISC processors.

New features in V2.0 include:

- POINTER variable type, giving compatibility with programs running on Cray computers
- Dynamic memory allocation
- Data initialisation can now be done in data type statements

Like its predecessor, the FORTRAN for RISC V2.0 Optimiser has been specifically designed for the MIPS co-processors used in Digital's RISC processors.

VAX FORTRAN V5.5 — SPD 25.16

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Complementary Software:** VAX CDD/PLUS, VAXset, VAX RdB/VMS,VAX DBMS. **Installation:** 10,000 blocks (5,120Kb). **Operation:** 4,650 blocks (2.4 Mb). If Multiprocessor DEBUG support is required for VAX Fortran, add an addtional: **Installation:** 4000 blocks (2000 Kb). **Operation:** 3000 blocks (1500 Kb).

TK50 **5**	Tape **M**
MEDIA	

LICENCE	QL-100A9-J	MEDIA	QA-100AA-H
DOCS	QA-100AA-GZ		

VAX FORTRAN HIGH PERFORMANCE OPTION V1.0 — SPD 32.67

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAX Fortran V6.0 or later (initially provided when you purchase this option). The VAX Language Sensitive Editor is also a mandatory prerequisite.

TK50 **5**	Tape **M**
MEDIA	

LICENCE	QL-YHBA9-J	MEDIA	QA-YHBAA-H
DOCS	QA-YHBAA-GZ		

VAX FORTRAN/ULTRIX V4.8 — SPD 27.23

VAX ULTRIX	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Required Software: VAX ULTRIX Operating System. Note that this compiler will only run under VAX ULTRIX or the ULTRIX Worksystem Software. All floating point operations are handled by the VAX hardware.

TK50 **5**	Tape **M**
MEDIA	

LICENCE	QL-A99A -AA	MEDIA	QA-A99AA-H
DOCS	QA-A99AA-GZ		

ULTRIX/RISC FORTRAN V2.0A — SPD 33.05

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

TK50 **5**	Tape **M**
MEDIA	

LICENCE	QL-VV6A -AA	MEDIA	QA-VV6AA-H
DOCS	QA-VV6AA-GZ		

Required Software: ULTRIX/RISC Operating System **Installation:** 1,660 blocks (850 Kb) **Operation:** 1,660 blocks (850 Kb).

PASCAL Compilers

NEW VERSION 4.1

WELL-STRUCTURED SOLUTIONS

PASCAL

Digital's PASCAL compilers accept programs compatible with either level of the ISO specification for programming languages: PASCAL [ISO 7185-1983(E)] as well as ANSI/IEEE770X3.97-1983 (December, 1983). VAX PASCAL also meets the Federal Information Processing Standard Publication (FIPS-109) requirements by accepting programs conforming to the ANSI standard.

VAX PASCAL:

- Marks all commands which go beyond the ISO and ANSI standards.
- Tests limits of fields, strings and domains during runtime; also checks for arithmetical overflows and branched jump instructions during runtime.
- Generates information for error tracing; creates a cross-references table.
- Supported by the VAX LSE language-sensitive editor and the VAX symbolic debugger.
- Can access and process information in a VAX Rdb relational or VAX DBMS Codasyl database.
- Supports the VAX inter-language calling standard, and can directly call VMS system services plus other products/utilities: SORT and Datatrieve, for example.

VAX PASCAL is fully integrated into the VMS environment. It offers all methods of accessing VAX RMS files: sequential, relative and indexed-sequential. Procedures in all other VAX languages can be called by VAX PASCAL. Various options can be specified at compilation time; these options perform additional checks during program runtime. Checks include illegal subscripts in matrix processing, illegal branches and illegal pointers.

```
MODULE RACE_TURNS;
VAR
   fuel_level : [EXTERNAL]REAL;
   engine_rpm : [EXTERNAL]INTEGER;
   driver_awake : [EXTERNAL]BOOLEAN;
PROCEDURE PIT_STOP; EXTERNAL;
[GLOBAL(T1)] PROCEDURE NEGOTIATE_TURN_1;
BEGIN
   IF engine_rpm > 1000 THEN WRITELN('YOU SPUN OUT!');
   fuel_level := fuel_level - 2.5;
   IF fuel_level < 3.0 THEN PIT.STOP;
   IF NOT driver_awake THEN WRITELN('WAKE UP!');
END;
```

PASCAL is used in both educational and commercial applications. Many internal Digital admin systems are written in VAX PASCAL.

PASCAL for RISC

PASCAL for RISC V1.0 is an implementation of the PASCAL language that accepts programs compatible with ANSI/IEEE770 X3.97-1983 (though it is not yet fully ANSI compliant). Like its VAX equivalent, the language contains control statements, data types and pre-declared procedures and functions. Extensions above the standard language include:

- Longer variable names
- Non-decimal number constants, string padding and constant expressions
- CASE.... OTHERWISE clause
- Facility for linking procedures and functions with the option of compiling them separately from the main program
- POINTER variable type, giving compatibility to programs running on Cray processors that use this feature
- Support for Conformant Arrays PASCAL for RISC generates optimised code that takes full advantage of Digital RISC hardware.

VAX PASCAL extensions

- DOUBLE data types (D and G format) and QUADRUPLE (H format) for the VAX extended floating-point representations.
- VARYING data type for strings of variable length, with up to 65,535 characters.
- String-handling functions such as INDEX, LENGTH and SUBSTR.
- Language elements for sequential, direct and indexed-sequential access to VAX RMS files.
- Facility for linking procedures and functions with the option of compiling them separately from the main program.
- Binary, octal and hexadecimal constants.
- External procedure and function declarations.
- Position-independent parameter passing.
- Variable names with up to 31 characters.

PASCAL V4.1 SPD 25.11

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Req. S/w: VMS Operating System. **Comp. S/w:** VAX CDD/Plus Common Data Dictionary, VAX Rdb Relational Database, VAX DBMS, VAXset Program Development Environment, VAX LSE, VAX SCA. **Installation:** 3,500 blocks (1.8 Mb), **Operation:** 3,000 blocks (1.5 Mb). If the optional STARLET VAX VMS System Library is required, add: **Installation:** 7000 blocks (3.5 Mb), **Operation:** 6000 blocks (3.0 Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-126A9-J**	MEDIA	**QA-126AA-H**
DOCS	**QA-126AA-GZ**		

PASCAL for RISC V1.0 SPD 33.04

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-VV4A -AA**	MEDIA	**QA-VV4AA-H**
DOCS	**QA-VV4AA-GZ**		

Required Software: Ultrix/RISC Operating System.

VAX PL/1

THE LANGUAGE OF SCIENCE AND INDUSTRY

VAX PL/1 is an extended implementation of the ANSI X3.74 1981, American National Standard PL/1 General Purpose Subset. Key features of VAX PL/1 include:

- Use of all VAX floating-point data types.
- Dynamic field declarations.
- Global optimisation.
- Ability to call code written in other languages and VMS system services.
- Support from the VAX LSE language-sensitive editor VAX SCA Source Code Analyser; and the VAXset Program Development Environment.

VAX PL/1 consists of a shareable compiler, a HELP facility, and a system interface library which includes declarations for system routines. The VAX PL/1 compiler runs under the VMS Operating System and generates optimised, position-independent machine code. Extensions include compatibility features with industry-standard implementations and ANSI full language features as well as VMS system-specific features.

Access to RMS

VAX PL/1 supports the complete VAX RMS file organisation. It provides extra functions for direct control of file attributes, such as file extension or owner queries.

Access to the VAX Common Data Dictionary (CDD) is also provided. A compile-time preprocessor facility allows language extension and conditional compilation.

Re-entrant, shareable code

A single copy of the VAX PL/1 compiler can be used simultaneously by all applications (it is 'shareable'). It produces optimised, shareable code which is compatible with the code generated by the other VAX languages.

Part of the big picture

As a native-mode VAX language, VAX PL/1 is integrated into the VAX common language environment. This integration provides VAX PL/1 users with support for the VAX Interlanguage Calling Standard, access to the VAX Symbolic Debugger ncluding support for source-line debugging), and callable interfaces to VAX utilities and optional products (such as SORT, VAX DATATRIEVE, and VAX DBMS).

VAX PL/1 V3.3 SPD 25.30

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Complementary Software:** VAX Language-Sensitive Editor, VAX Performance and Coverage Analyzer, VAX Source Code Analyzer, VAX Common Data Dictionary/Plus, VAX Rdb Relational Database, VAX DBMS Codasyl Database. **Installation:** 6800 blocks (3,500 Kb). **Operation:** 5000 blocks (2,600 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-114A9-J**	MEDIA	**QA-114AA-H**
DOCS	**QA-114AA-GZ**		

VAX RALLY

NEW VERSION 2.2

THE 4GL SOLUTION

VAX RALLY is an integrated fourth-generation language environment. A companion product to VAX Rdb/VMS, it enables you to develop applications more quickly and cost-effectively.

- Build simple to very complex VAX Rdb/VMS database and VAX RMS-based applications
- Assemble prototype applications quickly
- Transport and run applications on any VAX system.
- Create 'real' applications with multiple windows, 'strip' menus, complex menu flow control, and special function keys.

With this new version, extra capabilities include:

- The ability to use VAX ACMS database servers
- Support for VAX Rdb/VMS V4.0 Two-Phase Commit (2PC)
- VAX LSE can now be used to edit ADL procedures
- Uses field attributes stored in the CDD/PLUS repository when defaulting forms and reports
- Significant performance enhancements

VAX RALLY provides a single, consistent set of flexible tools to define Rdb/VMS databases, forms, reports, menus, on-line help, and error messages. It consists of two systems: the Definition System — for creating, modifying, and testing RALLY applications — and the Runtime System, for executing RALLY applications. The Runtime System can be purchased separately.

VAX RALLY is Digital's strategic 4th Generation Language. It is closely integrated with Digital's CASE, Database and Transaction Processing strategies.

VAX RALLY V2.2 SPD 27.03

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 20,100 blocks (10,291 Kb) without examples 13,400 blocks (6860 Kb) **Operation:** 18,100 blocks (9267 Kb) without examples 12,700 blocks (6502 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-A86A9-J**	MEDIA	**QA-A86AA-H**
DOCS	**QA-A86AA-GZ**		

VAX LSE/SCA LANGUAGE-SENSITIVE EDITOR

NEW VERSION 3.0

IT SPEAKS YOUR LANGUAGE

VAX LSE/SCA, a component of the VMS program development environment, is an advanced text editor and analysis tool designed specifically to help software engineers develop and maintain program code and assist in the preparation of technical documentation It offers:

- Integrated Source Code Analyser, previously available only as a separate product, at no extra charge.
- Faster entry of source code, via language-specific source code templates including system service templates (formatted language constructs).
- Creation, processing, compilation and verification of programs, plus assistance in eliminating compilation errors during a session; implementation instructions for non-Digital compilers also documented.
- DECwindows support including journalling, plus Forward/Reverse search and new predefined keys.
- Supports VAX Ada, VAX BASIC, VAX BLISS-32, VAX C, VAX COBOL, VAX FORTRAN, VAX PASCAL, VAX PL/I, VAX RALLY, VAX SCAN, VAX Document, and DECwindows UIL (User Interface Language) procedure calls.
- Program Design Facility (PDF) Support.

```
main()
{
    int i;
    for (i=0;i<=4;i=i+1)
        printf("factorial(%d) = %d\n", i, factorial(i));
}
int factorial(n)
{
    if(n<=1)
        return 1
    else
        return m*factorial(n-1);
}
[End of file]

Buffer TEST1.C   Insert  Forward
LSE Command > compile/review
```

LSE/SCA allows editing, debugging and rebuilding in addition to a range of source code analysis facilities from within a single screen session.

Simple interface, powerful potential.

VAX LSE/SCA was designed to meet not only the primary requirements of the software engineer, but also the more advanced needs of the developer:

- A simple interface, readily acceptable to VMS users.
- Language-sensitive features that improve developer productivity.
- Support for multiple languages with a consistent user interface.
- Support for user extensions.
- Fully automated interface to Version and Configuration control capability via VAX DEC/CMS.
- Parallel editing when testing and checking programs (i.e.: DEBUG and PCA interfaces).
- Customisable editing environment.
- Help for language(s) and help for editor available concurrently.

The DECwindows UIL (User Interface Language) support built into VAX LSE clearly demonstrates Digital's commitment to helping software engineers build DECwindows technology into their own applications.

Get it right... first time.

At first sight, the provision of templates may not appear to explain the great time-savings possible with VAX LSE/SCA. In practice, however, you'll find that you invoke the relevant compiler fewer times — because more is right first time round.

Saving Paper

The need for paper listings (particularly if using a Workstation) is all but eliminated. This means fewer trips to the printer! An added benefit of the the template approach is that engineers with little experience of a language can come up to speed quickly. And for the experienced developer, reports of 40% productivity gain on the edit-compile-review cycle seem to be the norm.

It all adds up to significantly increased productivity.

> **"If I had to balance the Ada compiler and the Language-Sensitive Editor, the editor itself would get maybe a 20% credit for our being successful."**
>
> — *Louis Springer, Sanders Associates (Ada project)*

> **"There can be no doubt that it [LSE] offers some of the most advanced features available today for a programmer on a VAX. If you program under VMS, you really should have a good look at LSE and see if it fits into your work environment, and judge for yourself."**
>
> — *Jeff Smith, in a DEC USER article.*

VAX LSE/SCA V3.0 SPD 26.59

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 9100 blocks (4550 Kb) **Operation:** 6100 blocks (3050 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-057A9-J**	MEDIA	**QA-057AA-H**
DOCS	**QA-057AA-GZ**		

Source Code Analysis

The VAX Source Code Analyser (SCA) portion of LSE/SCA is an interactive, multi-language, multi-module source code analysis tool designed to help software engineers fully understand complex software systems. SCA is now included in the base VAX LSE/SCA product (users who previously only purchased LSE and who have a support contract will receive the combined LSE/SCA product automatically at no extra charge). The SCA portion of LSE/SCA:

- Allows the programmer to view the call hierarchy of a software system.
- Provides interactive interrogation of variables and module references in source code; static analysis of source code; analysis of subroutine call consistency.
- Navigation and cross referencing across all application system modules.
- Supports VAX Ada, VAX BASIC, VAX BLISS-32, VAX C, VAX FORTRAN, VAX PASCAL, VAX PL/1; also supports multiple languages concurrently.

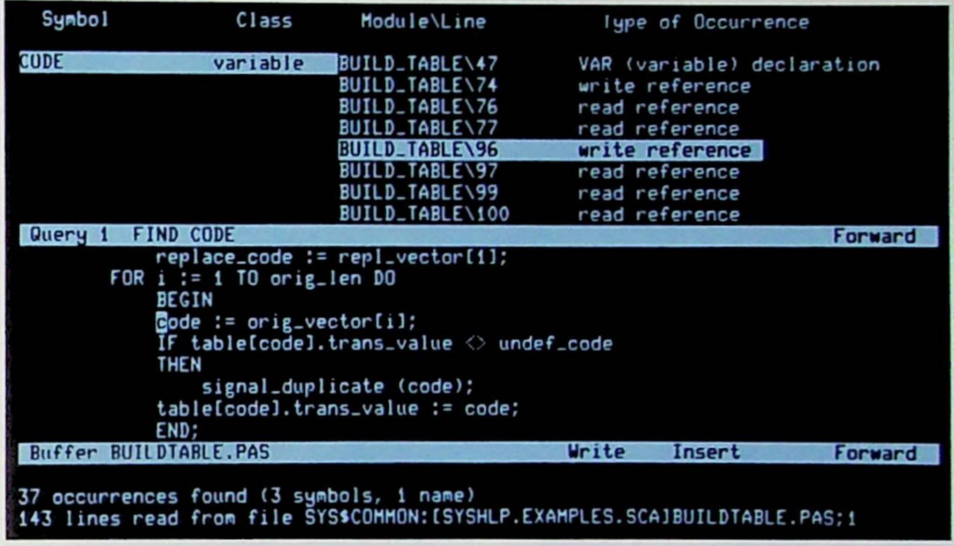
Put your code under the microscope

Working within the VAX Language Sensitive Editor (LSE), the source code analyser enables you to edit, compile, debug, and analyse source code in a single interactive session. LSE/SCA can be used to analyse an entire system, not just individual modules, and is exceptionally useful during the development and maintenance phases of a project. Programmers who are familiarising themselves with an existing software system will find LSE/SCA an indispensable tool.

A developer working on the VMS Run-Time Library (approximately 500,000 lines of code) 'suddenly discovered' the LSE/SCA toolset. He built the SCA library from the RTL source code and started using it as a support facility. His comment: 'I feel like a blind man suddenly able to see!'

Power tools for programmers

The VAX LSE/SCA system provides you with full information on variables and modules, including variable data type checks, the locations at which specific variables have been referenced, and comparisons of formal and current parameter lists in the case of subroutine calls.



VAX LSE/SCA allows the programmer to have a complete picture of a software system under review.

Simultaneously, you get an accurate overview of the interaction of different modules, including the variables and routines employed.

Other powerful features:

- Concurrent multi-language capability… particularly useful where an application is implemented in multiple languages.
- Availability of cross-reference by symbol usage (E.g.: set, used, declaration).
- Static analysis of parameter type and count of parameter calls.
- Selective and 'Wildcard' searches.
- Search lists of libraries to enable 'phased' development and accommodation of individual developer variants to the main library.
- Automated support from VAX DEC/MMS software.

It's there if you need it

Program Design Facility (PDF) is a set of enhancements that allow the programmer to integrate design pseudocode and related information in the source code of an application (as specially tagged comments). It has been designed for use by — but not limited to — developers who need to produce DoD-STD-2167a detailed design reports. A template is provided which will generate a VAX Document Source File corresponding to this format.

> **"I feel like a blind man suddenly able to see."**
>
> *— Developer using VAX LSE/SCA.*

PDF can provide various reports such as design cross-references, call trees, and use of data structures in a software system. To use the Program Design Facility, VAX LSE/SCA and one (or more) of the following compilers must be used:

- VAX Ada V2.1 or later
- VAX BASIC V3.4 or later
- VAX BLISS-32 V4.6 or later
- VAX COBOL V4.3 or later
- VAX FORTRAN V5.4 or later
- VAX PASCAL V4.0 or later

PDF allows pseudocode in any supported language syntax, and hence the design capture can be used with little or no training. LSE allows a developer to view an evolving design/source code file at various levels of detail, and even to 'reverse engineer' a completed code module to show the design.

With LSE/SCA, cross-referencing and static analysis can be done on the design information enclosed in the source code of a software system.

VAX DEC/CMS CODE MANAGEMENT SYSTEM

SOFTWARE TO MANAGE SOFTWARE

If you're a software developer, you're undoubtedly aware that one of the biggest challenges in software development is managing the development process itself. As different team members work on different phases and different modules, it soon becomes clear that you need a powerful code management system that presides over all aspects of the project. In short, you need DEC/CMS (Code Management System).

- An effective tool in tackling some of the fundamental management problems of software engineering.
- Significantly increases productivity at both the individual and group level by simplifying the management of development files.
- Tightly integrated with other VAXset products and, to varying degrees, with products from independent software vendors.

Managing code, solving problems.

Software systems are usually assembled from a number of building blocks: some re-used many times, some varying to a certain degree from release to release.

Managing access to program code, associating components of the system with one another (including specific versions and variants) and knowing at any given time the current status of each element of the project is an enormous undertaking.

The problems are complex. For instance, if two or more people need access to the same module (or if the same person wants to explore several approaches to the task), the development process can quickly go out of control because several separate modifications of the same module suddenly appear.

These and other configuration-related problems are tackled directly by DEC/CMS, an 'industrial strength' tool.

Powerful features

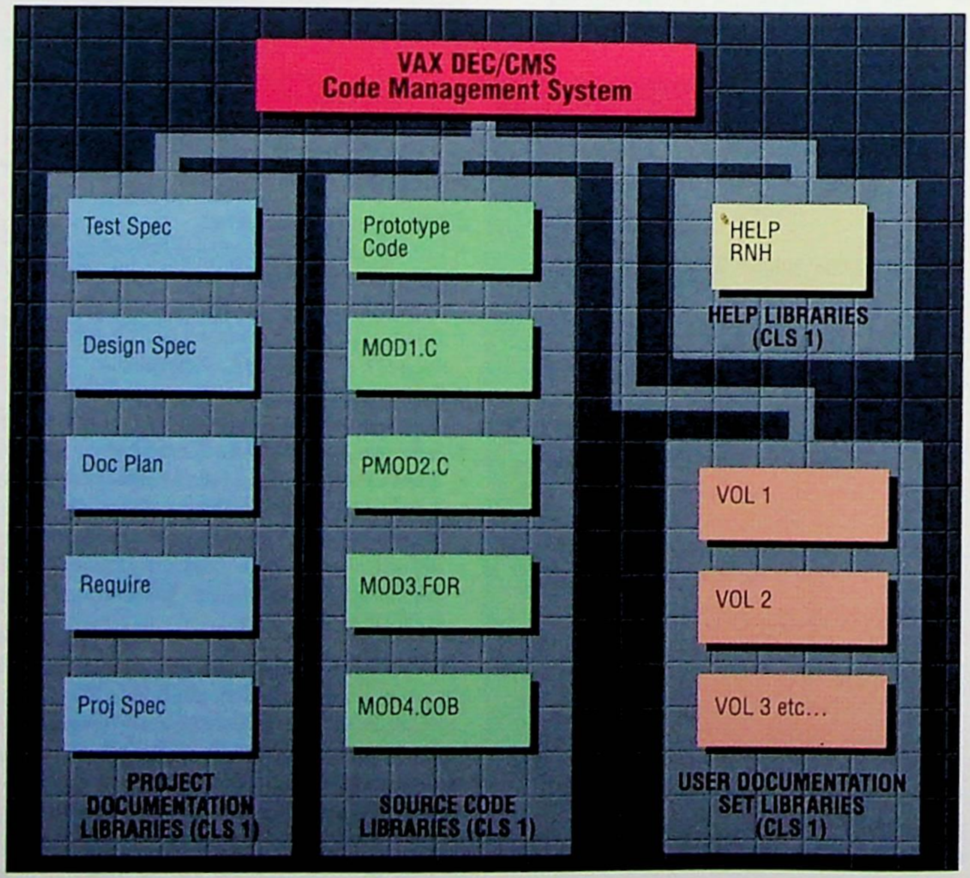
- Helps with the management of all files during software development, and documents their history.
- Maintains source files in a project library; enables recovery of earlier generations of files; manages current or separately developed modifications; monitors all movements into or out of the data library.
- Tracks the origin of any line in a file, providing the author's name and time of modification.
- Works in conjunction with all programming languages and editors.
- Development files may be ASCII (documentation, source code, command files, MMS description files) or binary (object code, executable code, graphics images).
- Fully integrated with other VAXset products and, to varying degrees, with the products of independent software vendors.
- Association of related elements by function or by configuration, including milestone and baseline tracking.
- DECwindows interface improves usability and shortens learning curve.

A thoroughly proven solution.

In the UK and around the world, CMS is used in developing systems in the fields of avionics, finance, manufacturing, science and research.

We at Digital use CMS ourselves. In fact, CMS is used by the VMS engineering team to provide the control needed to manage over 200 developers, working on 6 million lines of code where an access is made to the development software every 29 seconds and an update or modification every 13 minutes. Remember too, that Digital also supports multiple versions of VMS in order to meet customers' requirements. None of this would be possible without the help of CMS.

Used alone, CMS is an extremely effective product. When used in conjunction with the other VAXset tools there is no other product on the market that can match its functionality or effectiveness.



VAX DEC/CMS maintains a complete listing of a project, providing a full audit of software development.

VAX DEC/CMS V3.3												SPD 25.52					
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 6600 blocks (3.37 Mb) **Operation:** 3600 blocks (1.84 Mb).

TK50 **5** Tape **M**	
MEDIA	

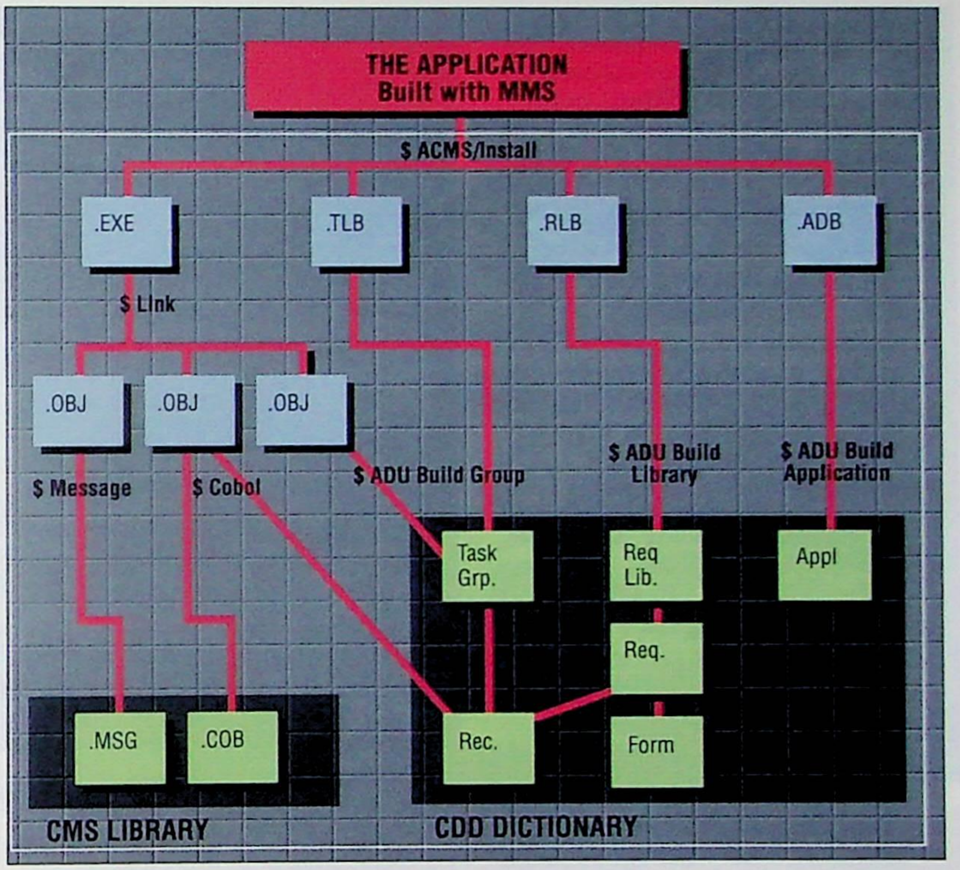
LICENCE	QL-007A9-J	MEDIA	QA-007AA-H
DOCS	QA-007AA-GZ		

VAX DEC/MMS MODULE MANAGEMENT SYSTEM

PUTTING IT ALL TOGETHER

VAX DEC/MMS (Module Management System) is a software development tool designed to maximise programmer productivity, improve software quality and speed up its development. It achieves these goals by tracking changes in individual software modules during the development and maintenance phases, enabling the software application to be re-constructed automatically incorporating the latest versions of all its modules.

- Saves valuable programming and system time by minimising the time required to build a complete software system.
- Maintains a record of the software system structure.
- Determines the actions required to construct new versions of applications; rebuilds only what is required, not necessarily the full system.
- May be used in conjunction with all VAX programming languages.



VAX DEC/MMS constructs applications quickly, by ensuring that only the modules changed since last system build get recompiled and relinked.

The diagram featured here represents the architecture of a software system. During the development and maintenance phases, where bugs are being fixed and enhancements made, constant reference to the software's architecture is necessary in order to ensure that the system can correctly be re-constructed, incorporating all relevant modifications.

By using an ASCII description of the architecture, MMS detects which components of an application have been modified and updates them together with their dependent modules. In addition, any other appropriate actions — for example, testing, notification to project leader, documentation updates and so on — could also be initiated automatically.

Problem-solving power

To use the diagram as an example, suppose that a problem is reported in 'The Application'. (We have chosen an Application Control and Management System (Transaction Processing) as our example.

The software engineer traces the problem down through the components '.TLB' and 'Task Grp.' to 'Rec.'. The 'Rec.' problem is fixed and he then re-traces his steps (re-building as he goes) back up to 'The Application'. It's easy to imagine how some ancillary actions — for instance, tracing the relevant paths to re-build the Cobol file, the 'ADU Build Group' and the '.RLB' file — might be overlooked. Moreover, the hierarchy dictates some synchronisation considerations. 'Dumb' command files are inefficient.

Building the system 'right'

MMS helps software engineering teams to 'build the systems right'. It addresses a real software engineering requirement: after all, if your developers are spending time maintaining their own tools to address this problem, then they're not working on the task in hand — developing the target application.

Additional features

- Optional access to VMS library, CMS library and Dictionary products.
- MMS description (architecture) file may be stored in the CMS library.
- Provides a 'what if' capability so that software engineers can decide whether to 'build now' or 'build later'.
- Provides on optional software switch to allow SCA cross reference data to generated automatically.
- Other appropriate actions may be automatically initiated as part of the system build.
- May be used to build documentation.

VAX DEC/MMS V2.5	SPD 25.03

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 1600 blocks (0.9 Mb) **Operation:** 750 blocks (0.4 Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-VADA9-J	MEDIA	QA-VADAA-H
DOCS	QA-VADAA-GZ		

VAX PCA PERFORMANCE AND COVERAGE ANALYSER

TUNE YOUR PROGRAMS FOR PERFORMANCE

VAX PCA is a VAXset dynamic analysis and test coverage tool. It performs two key functions in the software engineering process: it helps you identify performance problems including bottlenecks, and it provides test coverage analysis in order to determine which program sections have and have not been executed by a given test suite.

- Performance bottlenecks can be highlighted, down to source line level if required.
- Analysis and reports on a variety of performance parameters including duration of execution (real time and CPU time), page faulting, system service counts, input/output statistics, Ada multi-tasking information, execution counts, and test coverage including 'Acceptable Non-Coverage'.
- Supports VAX Ada, VAX BASIC, VAX BLISS, VAX C, VAX COBOL, VAX DIBOL, VAX FORTRAN, VAX Macro, VAX PASCAL, VAX PL/I, VAX SCAN.
- Version 2.1 supports the DECwindows interface.
- Integration with VAX Language Sensitive Editor: when invoked, LSE will retrieve the required source file, position the cursor at the appropriate point and allow SCA and CMS access (standard LSE functions).
- Integration with DEC Test Manager: DTM can be used to manage the performance tests.

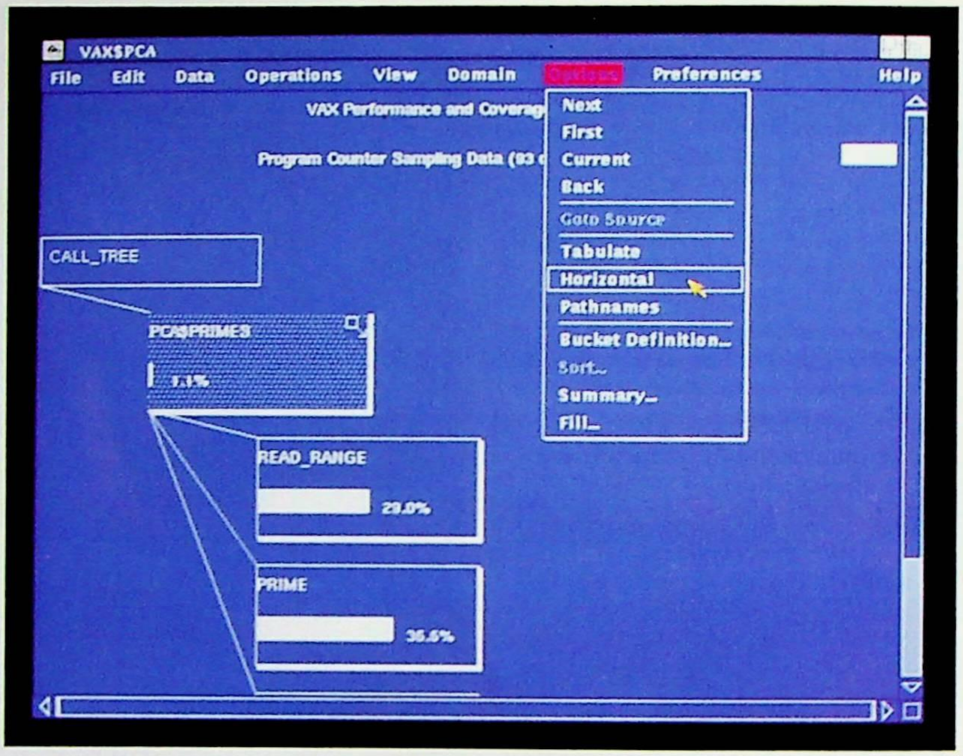
Gut feel often inaccurate

Use of PCA inside Digital has uncovered some surprises, particularly when debug code has been accidentally left in, and when system services or specific routines are called much more often than expected!

A programmer quickly gets the facts on which to invest his/her tuning time in the most productive way.

Fast problem identification

VAX PCA runs in two phases: the collector phase, in which it gathers the required information, and the analyser phase, in which it processes and presents the data.



Graphical assistance for pinpointing performance improvement opportunities.

The collector phase has only minimal impact on the full data analysis of the whole application. A single collection enables several analyses to be carried out to highlight potential areas for improvement to the required level of detail, without the need to rerun the application.

All evidence presented symbolically

PCA uses the DEBUG Symbol Table (DST) built by the appropriate language compiler(s) to provide fully symbolic program information. Data can be filtered for highly focused analysis.

The analyser lets you quickly and definitively identify the cause of software problems. Hotspots are presented in a variety of chart and/or text forms.

The management of tests by DTM (DEC Test Manager) also means that parameters for testing may be modified easily and thus hidden non-linear algorithms can easily be identified.

Faster software without faster hardware

VAX PCA has improved customers' applications significantly — sometime to such a degree that the purchase of more CPU power has been postponed. A 5–15% performance gain is not unusual for applications that are considered to be well-written, and we have seen far more dramatic performance improvements:

Ada	5-10%
TPU	40-600% (a special case)
MMS	30-90%
DTM	10000% (specific module).

Although VAX PCA offers significant benefits in terms of application performance and quality (through the use of test coverage) when used in a stand-alone role, its benefits are multiplied enormously when it is used in conjunction with DTM and LSE.

Both PCA and DEC/Test Manager are part of the VAXset Software Engineering Tools Package.

VAX PCA V2.2											SPD 26.76						
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 11,000 blocks (5632 Kb) **Operation:** 5,500 blocks (2816 Kb)

TK50 5	Tape M
MEDIA	

LICENCE	QL-119A9-J	MEDIA	QA-119AA-H
DOCS	QA-119AA-GZ		

VAX DEC/Test manager

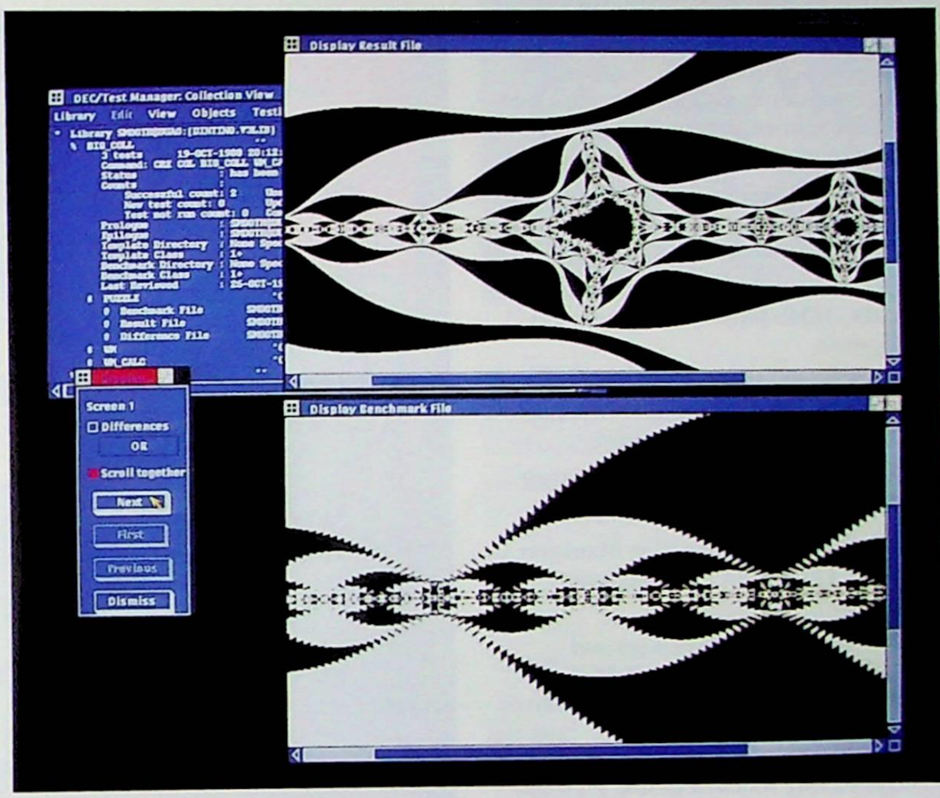
NEW VERSION 3.1A

TRIED AND TESTED

With the deadline pressures of the typical software development cycle, something's got to give — and all too often, it's the software testing phase. This phase is often near the end of the cycle and the time assigned to it tends to be 'squeezed'. Even where testing is done, subsequent development of the system can make the early tests meaningless.

With DTM, the VAXset regression test manager, software and the tests for the software are developed in parallel. These tests are then run against the application and re-run as the application evolves. Any departures from the expected or benchmark behaviour are quickly highlighted for investigation.

- Effectively automates the practice of regression testing, enabling quality-assured software to be produced.
- Organises application test suites for the running and checking of project code, using librarian techniques.
- Encourages a 'relational' type of approach to testing organisation; links test descriptions to test groups.
- Supports the DECwindows interface: can be used to regression-test DECwindows-based applications without manual intervention.
- Integrated with VAX PCA (and hence VAX LSE) and VAX DEC/CMS; regression tests can also be instigated from VAX DEC/MMS.
- Tests may be run unattended and/or out of hours.
- New! Several enhancements for testing DECwindows applications.



DEC/Test Manager can perform automatic comparisons between different software versions, including screen presentations.

Who uses DTM?

One of the biggest users of DTM is Digital itself! We market over 270 software products for our VMS platform… new versions of the operating system, new versions of the layered products, new versions of compilers, forms and dictionary products, new hardware platforms.

Clearly, we have a significant testing workload which is designed to ensure that we can continue to deliver quality software to our customers. (The VAX Cobol compiler, for example, has a regression test suite of over 20,000 tests). Such testing would be impracticable manually, and that's why the software engineering teams as well as our Software Quality Assurance organisation utilise DTM extensively in their QA activities.

Outside Digital, you'll find DTM at work in the major banks, aerospace companies, software houses and systems houses.

Our goal is to ensure that when delivery takes place of a new version of an operating system, or layered product, your applications will rebuild and execute correctly in the new environment. And of course, developers will wish to carry out comprehensive tests on their own software. All this usually takes several weeks of effort and perhaps some parallel running. That's where DTM can help.

> **“Digital's DEC/Test Manager is one of the very few good software testing tools on the market.”**
>
> *Tom Royer of Saunders Associates (a subsidiary of Lockheed Aircraft)*

New

VAX DEC/Test Manager has been enhanced for testing DECwindows applications. Added features include:

- Masking capability to help comparison of on-screen DECwindows images
- DECwindows Session Scripting
- 'Real-time' play of DECwindows tests.

VAX DEC/Test Manager (DTM) V3.1A												SPD 26.68					
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 7,000 blocks (3.58 Mb) **Operation:** 4,500 blocks (2.3 Mb).

MEDIA	TK50 **5** Tape **M**

LICENCE	QL-927A9-J	MEDIA	QA-927AA-H
DOCS	QA-927AA-GZ		

VAXset SOFTWARE ENGINEERING TOOLS

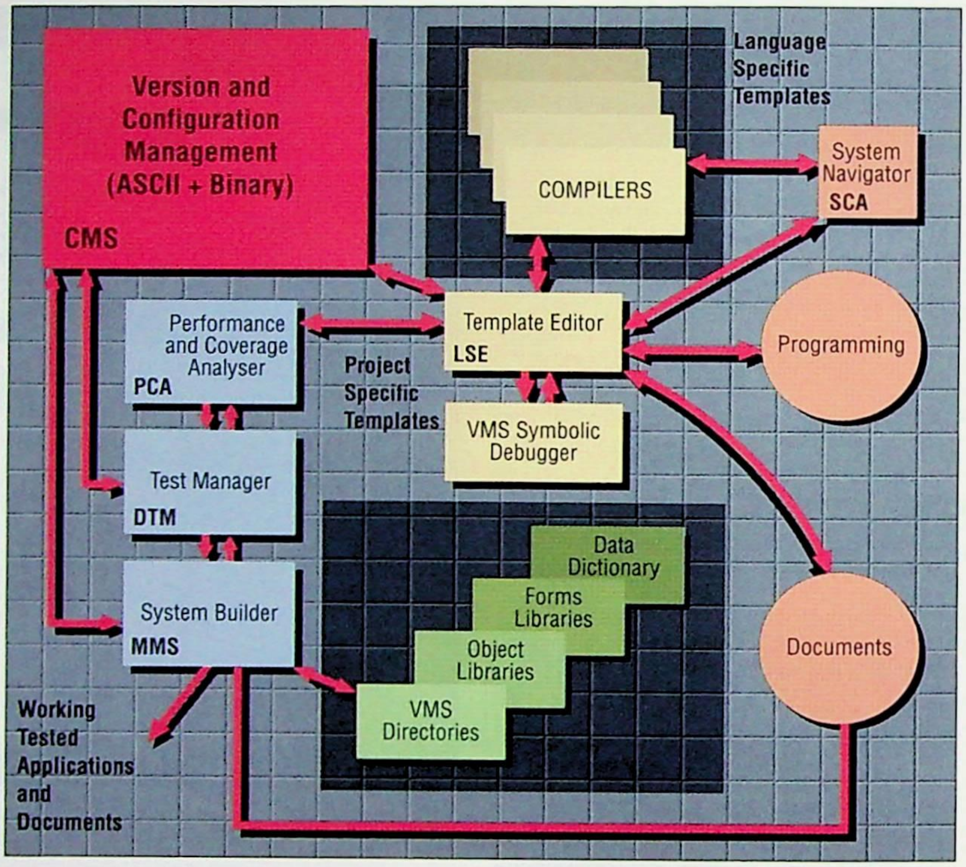
NEW VERSION 9.0A

THE RIGHT TOOLS FOR THE JOB

The VAXset (VAX Software Engineering Tools) package offers professional developers truly integrated, high-quality CASE products that address the fundamentals of software engineering. Ordered via a single part number, the package includes:

- VAXset Version and Configuration Control: VAX DEC/CMS Code Management System.
- VAXset System Builder: VAX DEC/MMS Module Management System.
- VAXset Multi-language Syntax Template Based Editor: VAX LSE Language-Sensitive Editor.
- VAXset Static Analysis Tool: VAX SCA Source Code Analyser.
- VAXset Regression Test Manager: VAX DTM DEC/Test Manager.
- VAXset Dynamic Analysis (Performance Optimiser) and Test Coverage Tool: VAX PCA Performance and Coverage Analyser.

VAXset V9.0 includes the new Program Design Facility inherent in LSE V3.0 and SCA V2.0, and adds a new improved version of the DEC/Test Manager (V3.0). VAXset V9.0 also includes a PDF template for use by VAX Document, which will generate the layout required to comply with DOD-STD-2167a detailed design reports.



VAXset is an integrated Program Development Environment.

The best of working together

Each VAXset component is a powerful tool in its own right, finely optimised for its specific function. Used together as part of a total CASE approach, the VAXset tools combine to create a whole that is very much greater than the sum of the parts in every respect — except the price. (You'll find that it costs less to purchase the VAXset tools as a package than as separate components.)

The VAXset package is not a bundling of loosely associated products. The components have been carefully designed to integrate with one another and other Digital and ISV (Independent Software Vendor) tools to a very fine level, as well as offering comprehensive capabilities in their own right. The components have been used extensively by Digital's Software Engineering Organisation, as well as many independent software vendors and customers.

The six products in the package are also described separately. As you read you may find the diagram on this page a useful reference in understanding how the individual products relate to one another.

DECwindows interfaces

Interfaces to most of the VAXset tools have been revised to utilise DECwindows, (subject to appropriate hardware support), making the products faster to learn and easier to use. The 'character cell' based interface has also been retained to preserve your current investment.

Already own part of VAXset?

We're aware that you may already use some of VAXset's components. Since the package costs less than the total cost of the individual components, you may wish to 'upgrade' on favourable terms. Ring DECdirect for details of our special upgrade offer.

> **"It's hard to put your finger on one or two specifics about these products; it's a thousand little things that make them so much better than anything else."**
>
> *Neil Baldridge of Compushare on VAXset. (a subsidiary of Lockheed Aircraft)*

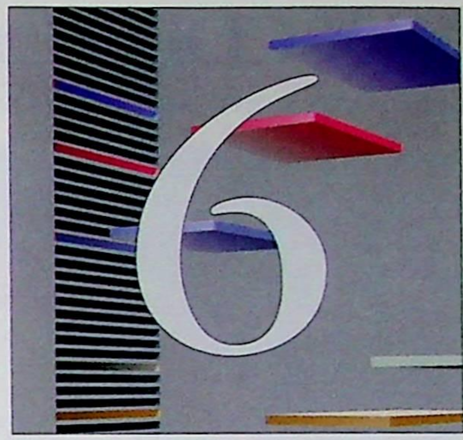
VAXset Package V9.0A SPD 27.07

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 31,650 blocks (16.2 Mb) **Operation:** 26,150 blocks (13.4 Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-965A9-J	MEDIA	QA-965AA-H
DOCS	QA-965AA-GZ		



Information management

Information is the most valuable asset of today's business organisations. The companies with the ability to capture, access, interpret, manage and distribute this key resource are those that will retain and expand their competitive advantage.

Digital's hardware and software products are the foundation of our strategy for enterprise-wide data management and transaction processing — and can make a direct contribution to your competitive edge.

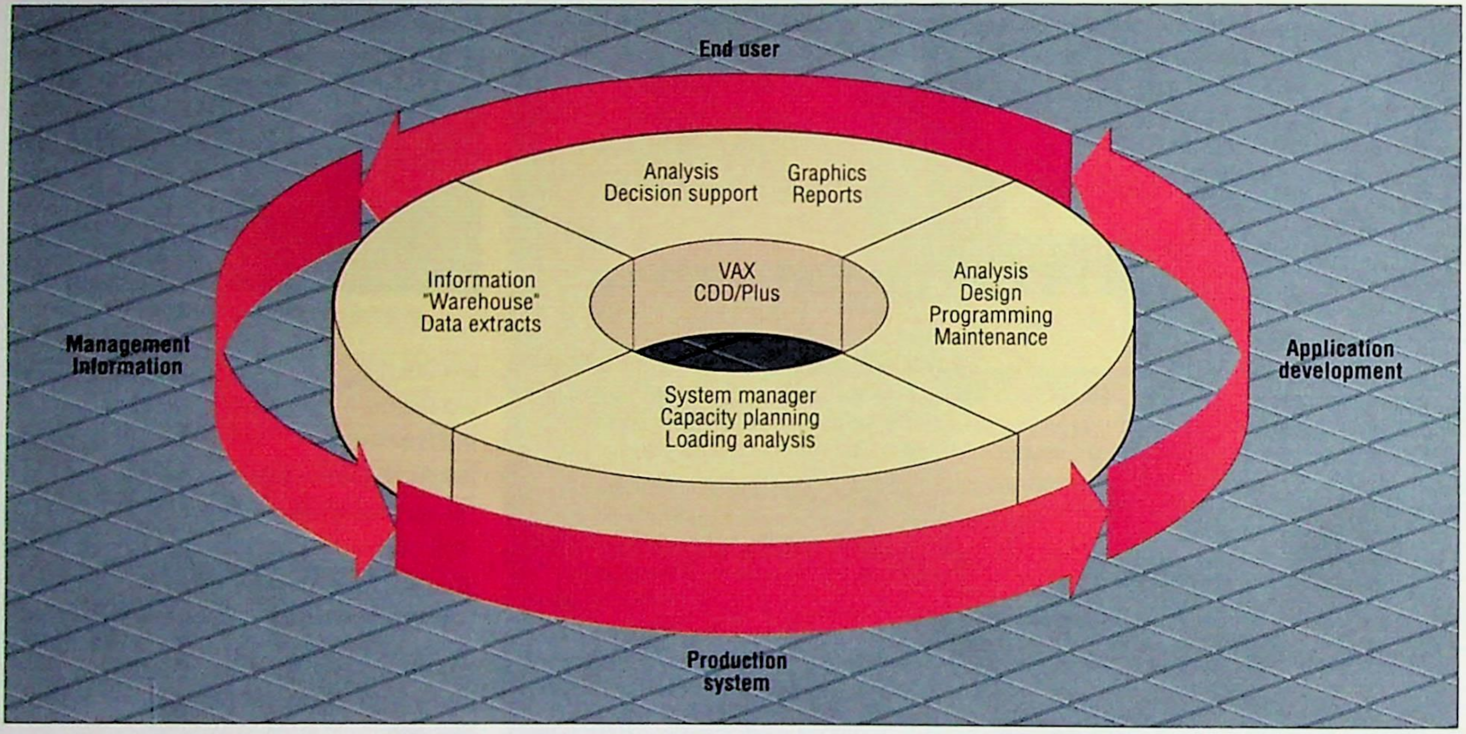
The backbone of our information-sharing capability is the VMS operating system, which runs on every VAX computer, irrespective of size. Another key component is DECnet, which allows an organisation's computer resources to be linked in a variety of configurations, and provides access to information on remote computers.

Other Digital products let you access foreign database environments (such as DB2 on IBM mainframes) as if they were local databases on your own machine. Digital has also announced its intention to offer industry-standard SQL/Services to enable direct information access from ULTRIX, MS-DOS, OS/2 and Apple Macintosh applications. These are in addition to the SQL facilities built into our Rdb/VMS relational database.

See also:

VAX CDD/Plus COMMON DATA DICTIONARY

DISTRIBUTED, ACTIVE CASE AND DATA DEFINITION REPOSITORY



VAX CDD/PLUS is Digital's hierarchically structured ACTIVE distributed data dictionary.

The VAX Common Data Dictionary/Plus (VAX CDD/Plus) is a dictionary and repository system that provides an efficient method of organising and managing data and integrating applications across your organisation. Using VAX CDD/Plus, you can:

- Create data definitions to be shared by many VAX programming languages and VAX information management systems across multiple applications and mixed-vendor environments.
- Store and access data definitions in multiple dictionaries anywhere on a network for both individual and universal use.
- Guard against redundant and inconsistent definition, and protect the dictionary against unauthorised use and system failures.
- Improve control over application development, management of information and application resources.

Dictionary definitions

VAX CDD/Plus is used to create, analyse and administer data definitions. These data definitions (called metadata) describe data, how that data is interrelated, and how it is used. The metadata in VAX CDD/Plus track the name, description, location, type, format, size, change history, and usage of the actual data. VAX CDD/Plus users can access dictionaries on different devices on a single node, on different nodes in a VAXcluster, and on nodes connected by a local or wide area network.

Field-level data descriptions

VAX CDD/Plus dictionaries can create and access metadata in a unit as small as a field. Field definitions can be simple data structures or complex subscripted structures. You can easily combine these field definitions to form various record definitions and access them individually from supporting VMS products. Field-level data descriptions increase the level of data sharing possible.

Automatic relationship support

VAX CDD/Plus automatically creates relationships when you connect two definitions in some way. For example, you can base the definition of a new field on an existing field definition. Similarly, you can relate a group of field definitions to a record definition by including the field names in the record definition. There is no need for you to specifically define these relationships because VAX CDD/Plus automatically creates the connection.

Usage tracking

Because VAX CDD/Plus is built on an entity-attribute-relationship model, it stores relationships between data definitions and components of applications. It provides powerful impact analysis and shows the effect of definition changes on applications. It becomes easier for you to maintain applications and to control change.

You can control changes to definitions in two ways: You can change the original definition to take effect immediately, or you can create a new version of the definition for users to incorporate over time. Warning messages alert users to the presence of a new version of a dictionary definition or to inconsistencies between the dictionary and external copies. The two methods of incorporating changes provide flexibility for you to address the different needs of developers and those running critical production systems, and to preserve data consistency at the same time.

Data security and integrity

VAX CDD/Plus equips the data administrator with the tools to grant or deny specific access rights to dictionary definitions. Security provisions for definitions are consistent with established VMS protection schemes.

The integrity of CDD/Plus sessions is protected against system failures by automatic journalling.

Open architecture

VAX CDD/Plus provides the means for a universal dictionary serving your needs across distributed, multi-vendor applications. Independent software vendors are able to layer their own products and applications directly onto CDD/Plus.

CDD/Repository: The future direction for CDD/Plus

The next major release of the Common Data Dictionary, V5.0, will be available in May 1991. Called CDD/Repository, it will be available for both VMS and UNIX platforms. With this new release, the CDD will be packaged as follows:

- CDD/Repository — an evolution of the distributed, active CDD/Plus dictionary/repository product available today. The CDD/Repository will provide the mechanism for integration of data management functions and life-cycle tools for both VMS and ULTRIX/RISC.
- CDD/Administrator — a new DECwindows-based product providing access to the CDD/Repository for repository administrators.

CDD/Repository

The CDD/Repository supports ATIS ('A Tools Integration Standard'), an evolution and extension of certain interfaces from Atherton Technology's current Software Backplane product (ATIS has been accepted as a draft proposal in the ANSI IRDS committee). This provides an open, standardised object-orientated interface to the CDD repository for both today's applications, and an enabling technology for a whole new generation of CASE tools.

The information model used to construct a repository is accessible to third party developers and hence their applications as well. This helps reduce the amount of redundant data between applications from multiple sources, simplifies the development process and leads to high quality products for your user community.

Although CDD/Repository contains significant new functionality, tools and applications designed to work with previous releases of CDD/Plus will continue to work with CDD/Repository V5.0.

CDD/Administrator

The importance of easy repository access is increasing in lock step with the growing reliance on repositories as containers for information about a business, its data and its applications. CDD/Administrator is the first in a series of easy-to-use Repository administration and access tools to be provided by Digital.

CDD/Administrator is a DECwindows-based, fully customisable, graphical management tool for CDD/Repository. It allows people who manage or administer repositories to locate, query, manipulate, manage and report on objects stored in the CDD using a graphical interface. CDD/Administrator will be available on both VMS and ULTRIX/RISC platforms from first customer release.

A callable interface is also provided, helping developers to provide a consistent look and feel across multiple operating system platforms.

VAX CDD/Plus V4.1A — SPD 25.53

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 33,000 blocks (16896 Kb) **Operation:** 28,500 blocks (14592 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-897A9-J**	MEDIA	**QA-897AA-H**
DOCS	**QA-897AA-GZ**		

CDD/Administrator for VMS V1.0 — SPD 32.74

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Installation:** 33,000 blocks (16896 Kb). **Operation:** 28,500 blocks (14592 Kb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-YP8A9-PB**	MEDIA	**QA-YP8AA-H**
DOCS	**QA-YP8AA-GZ**		

CDD/Repository for Risc V5.0 — SPD 32.73

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-VPAA** ☐ **-AA**	MEDIA	**QA-VPAAA-H**
DOCS	**QA-VPAAA-GZ**		

CDD/Administrator for Risc V1.0 — SPD 32.73

ULTRIX/RISC	A	C	N	S	2	3	4	D
LICENCE PRICE								

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-VPAA9-PB**	MEDIA	
DOCS	**QA-VPAAA-GZ**		

VAX DBMS

NEW VERSION 4.2

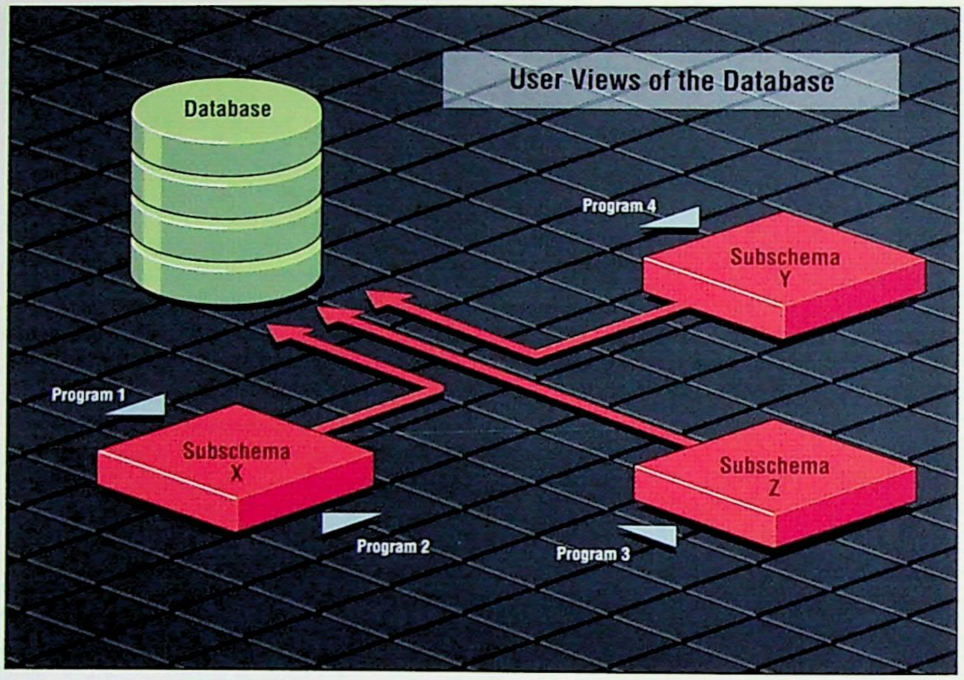
CODASYL DATABASE MANAGEMENT SYSTEM

VAX DBMS is a general purpose, network-model database management system that complies with the specifications of the Conference on Data Systems Languages (CODASYL).

- CODASYL network database that uses the VAX CDD/Plus Common Data Dictionary to store data definitions centrally.
- Built-in data integrity facilities, including before- and after-image journalling, plus high-speed backup/restore.
- Database Query Utilities (DBQ), allowing the application developer to test program logic interactively.
- Can be used from any native mode VMS computer language.
- Includes support for DECdtm, a true two-phase commit protocol.
- New! Enhancements to the Restructuring Utility, giving the Database Administrator the ability to change database characteristics without the need to reload the database.
- Integrates with DECtrace and RdbExpert tools for optimum tuning based on day-to-day database use

VAX DBMS is intended to serve as a data management system for organisations in which:

- There is a large amount of data retrieval.
- There are many concurrent users.
- Data relationships are complex.
- Database implementations are long-term.
- A professional database designer/administrator is available.



Features include:

Separate data definitions
Separating data definition from program development can lower the cost of program development and maintenance.

Centralised data definitions
Centralising data definitions avoids multiple definitions and make it easier for many users to share the same data.

Restructuring without reloading
You can add areas, fields, records, and most new set relationships without having to unload and reload the database. This feature is especially useful for applications that occasionally require design enhancements.

Different user views of data
Each program views a database through a special logical structure, written outside the program, called a subschema.

VAX DBMS is suited to applications with many simultaneous users and a stable database structure.

Centralised database administration
By separating programs from the data definitions used by those programs, you can separate the responsibility for the creation and maintenance of programs from the defining of data and the maintaining of a database. This requires that a database administrator (DBA) be available in your organisation.

Database integrity and security
VAX DBMS allows you to use several safeguards to ensure that data is accurate, complete, and up to date. These include making backup copies of the database and using before-image or after-image journalling.

VAX DBMS V4.2 SPD 25.48

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 37,000 blocks (19.0 Mb) **Operation:** 15,500 blocks (7.9 Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-899A9-J**	MEDIA	**QA-899AA-H**
DOCS	**QA-899AA-GZ**		

VAX DBMS Runtime V4.2 SPD 25.48

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 21,500 blocks (10.8 Mb) **Operation:** 12,500 blocks (6.4 Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-915A9-J**	MEDIA	**QA-915AA-H**
DOCS	**QA-915AA-GZ**		

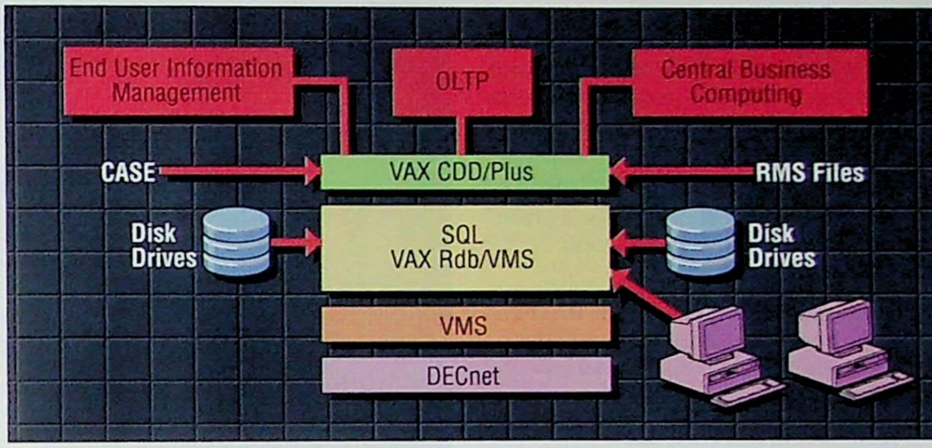
VAX Rdb/VMS

NEW VERSION 4.0

THE INTERACTIVE PERFORMANCE LEADER

VAX Rdb/VMS is a relational database management system designed for use in general-purpose, multi-user and transaction processing applications. With Version 4.0 there are several major new features.

- DECdtm support allows applications to update multiple databases across the network and guarantee full database integrity.
- NCSC C2 security features give commercial customers full American Department of Defence levels of security.
- Significant enhancements to the VAX Rdb/VMS SQL interface including Two Phase Commit transactions, support for the Segmented String datatype and SQL Module language support for CDD/Plus record definitions.
- SQL/Services support for OS/2.
- Direct Read/Write access from all processors in a VAXcluster, and from all CPUs in a VMS Shared Multi-processor (SMP) system.
- Development options contains precompilers for VAX C, VAX BASIC, VAX COBOL, VAX FORTRAN, VAX Ada, VAX PL/1, and VAX PASCAL for faster program execution.
- Row-level locking provided at no extra charge.
- Includes an industry-standard compliant SQL, which also supports Digital's VIDA with DB2 package, providing access to IBM/DB2 databases.
- Callable from any VMS native mode computer language, and runs on any size of VAX computer system.



DECdtm Support

VAX Rdb/VMS V4.0 has implemented full support for multi-database update transactions. Through the use of DECdtm, an integral part of VMS V5.4, applications can issue distributed transactions with minimum effort. With DECdtm support, applications can update multiple databases across the network , and guarantee full database integrity, a key feature for Distributed On-Line Transaction Processing.

Powerful capabilities

VAX Rdb/VMS takes full advantage of the VAXcluster environment by providing concurrent use, cluster-wide journalling and automatic recovery from node failure. VAX Rdb/VMS also supports the Digital Standard Relational Interface (DSRI), which provides for database access through DECdecision, TEAMDATA, VAX RALLY, VAX DATATRIEVE, and all DSRI-compliant VAX applications software.

Desktop to datacentre

With the Rdb runtime licence provided as part of every VMS system, it's possible to move databases and applications from one processor to another without modification, at minimum cost.

Rdb has all the features needed for mission-critical applications. These include the ability to recover from CPU failures in a VAXcluster without operator intervention.

Ordering options

VAX Rdb/VMS Development is available to any organisation developing applications for the VAX Rdb/VMS relational database. It contains all the full database maintenance, definition, administration and manipulation facilities. VAX Rdb/VMS Interactive Option supports the execution of previously developed applications, and provides the ability to perform database definition and queries using the interactive versions of SQL and RDO. The Rdb/VMS Runtime Option is available to support the execution of previously developed applications on a target machine.

VAX Rdb/VMS Runtime V4.0	SPD 25.59
LICENCE	Included in VMS
MEDIA (TK50)	QA-358AA-H5

Required Software: VMS Operating System. **Installation:** 25,000 blocks (12Mb) **Operation:** 18,000 blocks (9Mb).

VAX Rdb/VMS Development V4.0 — SPD 25.59

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 40,000 blocks (20 Mb) **Operation:** 30,000 blocks (15 Mb)

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VD2A9-J**	MEDIA	**QA-VD2AA-H**
DOCS	**QA-VD2AA-GZ**		

VAX Rdb/VMS Interactive Option V4.0 — SPD 25.59

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 25,000 blocks (12 Mb) **Operation:** 20,000 blocks (10 Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-VCLA9-J**	MEDIA	**QA-VCLAA-H**
DOCS	**QA-VCLAA-GZ**		

DEC RdbExpert for VMS

DATABASE DESIGN EXPERT SYSTEM FOR Rdb/VMS

DEC RdbExpert is a VMS-based product which generates high performance VAX Rdb/VMS. It also provides some significant features that increase the productivity of the database administrator. DEC RdbExpert benefits its users by:

- Generating a high-performance database physical design for a given logical design and transaction workload.
- Providing a mechanism for dramatically improving the productivity of individuals involved in database tuning and physical design.
- Generating the command procedures for creating, unloading and loading the database.
- Giving users insights to the design choices, thus allowing them to learn in the process.

Based on expert systems technology, DEC RdbExpert analyses:

- Database logical design
- Transaction workload information (from DECtrace) and priorities
- Data volume information
- System Environment

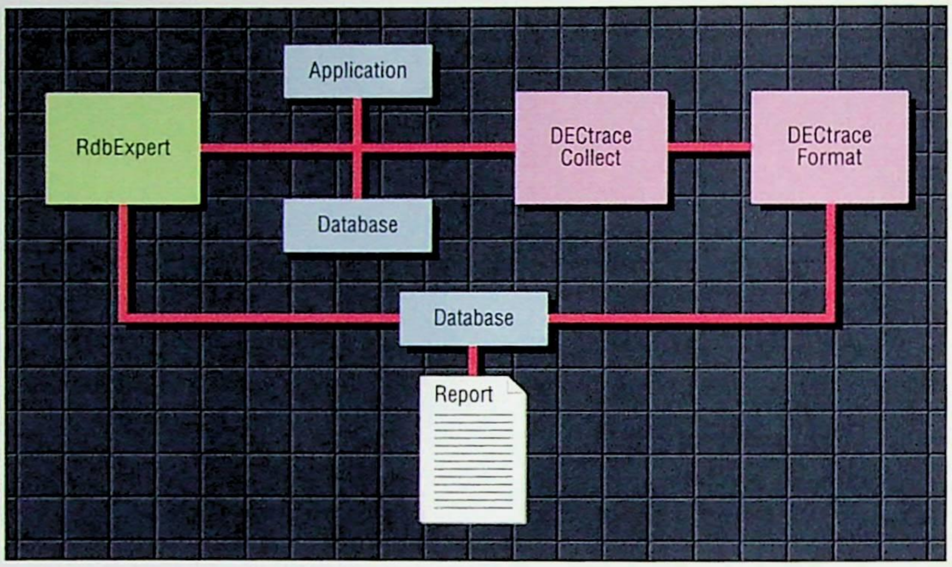
...and uses this information to provide:

- Executable database unload and load procedures (for VAX Rdb/VMS)
- Executable database creation procedure (VAX Rdb/VMS)
- Runtime parameters
- A design report, which documents the design and includes the reasoning leading to it

This new physical database design is tuned for its specific business needs. Using DEC RdbExpert, a database administrator can optimise the same logical database for each system on which it will reside, thus improving performance at each site.

Extensive knowledge

DEC RdbExpert contains extensive tuning rules based upon database experts' knowledge of physical database design principles and of database management system internals. This detailed knowledge includes that of the VAX Rdb/VMS query optimiser. Because of these rules, DEC RdbExpert greatly enhances the capabilities of less experienced data administrators.



DEC RdbExpert is a physical database design tool that assists Database Administrators (DBAs) and database designers in optimising VAX Rdb/VMS performance.

Choice of user interfaces

DEC RdbExpert provides both a DECwindows and command line interface for easy importing and manipulating of the required design information, and for generating the design output.

Old and new

DEC RdbExpert can be used for optimising both new and existing databases. When optimising an existing database, DEC RdbExpert can make use of the actual transaction workload information provided by the DECtrace for VMS product. This greatly reduces the amount of time required to perform this otherwise tedious and critical step and increases the accuracy of the workload analysis.

Central use for remote targets

Since DEC RdbExpert can import database information and DECtrace workload data over the network, the databases to be optimised can reside on processors other than the one used to run DEC RdbExpert.

DEC RdbExpert stores its design information in an VAX Rdb/VMS V3.1 or later database and requires a minimum of the VAX Rdb/VMS Runtime software to be installed on the same system. You must have access to the development version of VAX Rdb/VMS in order to execute the command procedures necessary to create/recreate the optimised database; these may reside on any target system, to which the command procedures can be copied for local execution.

DEC RdbExpert for VMS V1.0 — SPD 31.72

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System Version 5. VAX Rdb/VMS V3.1 Runtime or greater.

	TK50 **5** Tape **M**
MEDIA	

LICENCE	QL-VFJA9-J	MEDIA	QA-VFJAA-H
DOCS	QA-VFJAA-GZ		

DECtrace for VMS

EVENT TRACKING AND PERFORMANCE ANALYSIS

DECtrace for VMS provides the means of collecting and reporting event-based data and performance information from applications and databases. DECtrace is:

- Tightly integrated with VAX Rdb/VMS, VAX DBMS and VAX ACMS to provide performance and event information for use in tuning databases and VAX ACMS applications.
- Supports DECintact and standard 3GL applications through a set of service routine calls.
- Provides detailed database transaction workload information for use by VAX RdbExpert when optimising physical database designs for VAX Rdb/VMS and VAX DBMS.
- Designed to operate with minimal system overhead and thus can be used in both development and production environments.

Two major components

DECtrace provides two major components. The first is a set of service routine calls for placement within the application software. The second is the DECtrace administration component. Through a command line interface, the user can register an application, select the criteria on which to collect data, and schedule a collection based on the events of interest. The data is later formatted into a VAX Rdb/VMS database for analysis.

DECtrace for VMS V1.0											SPD 25.G1					
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System.

TK50 **5**	Tape **M**
MEDIA	

LICENCE	**QL-VW2A9-J**	MEDIA	**QA-VW2AA-H**
DOCS	**QA- VW2AA-GZ**		

DEC RdbAccess for ORACLE on VMS

NEW PRODUCT

DIRECT ACCESS TO ORACLE DATABASES

DEC RdbAccess for ORACLE provides direct, transparent, read-only access to ORACLE databases residing on VMS systems from applications developed using products such as VAX RALLY, VAX DATATRIEVE, VAX TEAMDATA and DECdecision.

RdbAccess for ORACLE also supports:

- Access from the VAX Rdb/VMS interactive utilities, SQL and RDO.
- Access from pre-compiled 3GL applications with embedded SQL or RDML, and from desktop applications using SQL/Services.
- Extraction and replication of ORACLE sourced data, using the VAX Data Distributor, to an Rdb/VMS target anywhere on an enterprise-wide computer network
- RdbAccess for ORACLE can direct a request to a remote ORACLE database using ORACLE's SQL*Net.

Direct Access

RdbAccess for ORACLE provides direct database access to VMS-based ORACLE tables and views. The user application accesses ORACLE data the same way it would access Rdb/VMS data; data retrieved from ORACLE can be displayed at a user's terminal, printed, or copied to another database or file using any standard Rdb/VMS compliant application.

ORACLE data can be accessed directly from pre-compiled 3GL programs using embedded SQL, SQL module language, dynamic SQL, callable RDO, or RDML. These data access sublanguages are the same sublanguages used to access VAX Rdb/VMS data tables and views.

ORACLE data can be accessed interactively using VAX Rdb/VMS. ORACLE data can be accessed through SQL/Services directly from desktop applications running on MS-DOS, OS/2, Macintosh, ULTRIX or VMS.

ORACLE data can be extracted and stored in Rdb/VMS tables using VAX Data Distributor. Data from multiple ORACLE databases can be rolled up into a single Rdb/VMS table.

When RdbAccess for ORACLE is used with VAX DATATRIEVE, users can generate DATATRIEVE queries and reports that include data from both ORACLE tables or views and Rdb/VMS tables or views.

When RdbAccess for ORACLE is used with DECdecision or VAX TEAMDATA, end users can access ORACLE data tables and views directly, join them with Rdb/VMS tables, store the results in folders, download the data to a PC-based spreadsheet, etc., for use in decision support and other personal and departmental applications.

Distributed Access

RdbAccess for ORACLE supports remote access to ORACLE data using either VAX Rdb/VMS remote data access capabilities or ORACLE remote data access capabilities. RdbAccess for ORACLE must be installed on the same node as an ORACLE DBMS instance. Applications on a remote node can access ORACLE provided that the remote node is running VAX Rdb/VMS.

RdbAccess provides a logging facility that can trace communications activity, log errors, and help isolate problems.

DEC Rdb Access for ORACLE on VMS V1.0											SPD 32.80					
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

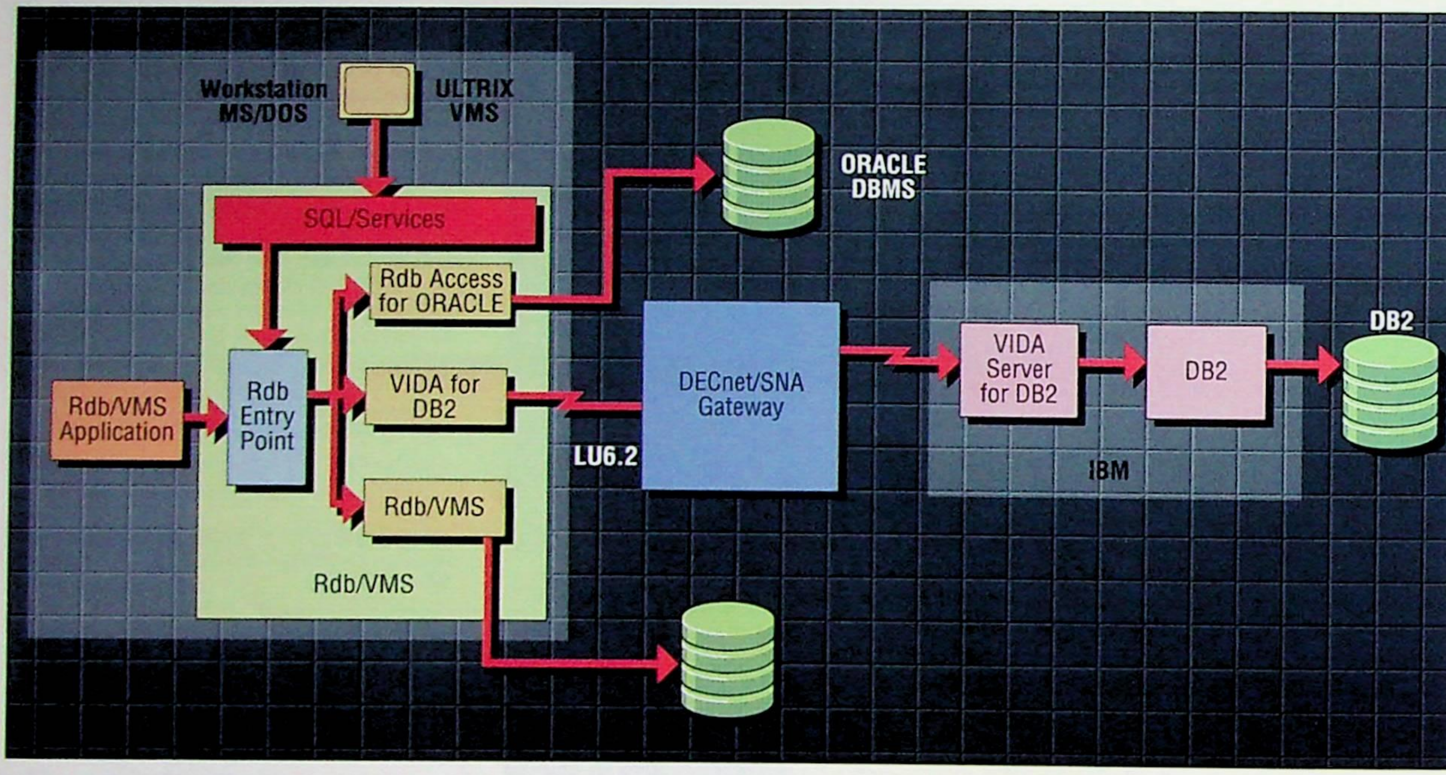
Required S/w: VMS Operating System V5.2-V5.4, VAX Rdb/VMS V3.1 or later, DECnet-VAX V5.2 or later and ORACLE DBMS V5 or V6. At least one Rdb/VMS development licence must be installed, although it doesn't need to reside on the same node as the ORACLE DBMS instance. VAX Rdb/VMS Development, Interactive or the Runtime option must be installed on the VAX from which the user initiates access. Disk Space required for **Installation:** 4,500 blocks (2.3Mb), **Operation:** 1,900 blocks (0.97Mb).

TK50 **5**	Tape **M**
MEDIA	

LICENCE	**QL-YQVA9-J**	MEDIA	**QA-YQVAA-H**
DOCS	**QA-YQVAA-GZ**		

VIDA

THE KEY TO UNLOCKING CORPORATE DATA



To remain strong and competitive, organisations must make electronically stored information available to all who need it. Digital VIDA products:

- Provide direct, read-only access to IBM-based DB2 or IDMS/R databases.
- Enable VAX users and applications to transfer selected fields and records from IBM databases to VAX databases, files, applications, and devices.
- Run on the full range of VAX systems.
- The VIDA Copy Facility enables tables to be uploaded from VAX to IBM.

VIDA in your organisation

VIDA provides VAX users and application programs with direct, transparent, read-only access to IBM databases.

VIDA works with software tools already familiar to VAX users: DECdecision, VAX DATATRIEVE, VAX TEAMDATA, Rdb/VMS, as well as with application programs. VIDA also works with VAX Data Distributor to provide automatic, pre-scheduled database transfers from an IBM to a VAX system.

Full security

VIDA preserves the security and access privileges of data on your IBM system; the administrator of the IBM system defines the limits of access via VIDA. Access can also be controlled using popular IBM security packages such as RAFC and ACF2.

On the VAX side, a VMS system manager can protect any or all VIDA access routines from any VMS user not permitted to read the IBM databases. And since VIDA lets the creator of access files omit protected values such as passwords from file storage, programmers writing data retrieval programs can include procedures that prompt users to enter protected information at runtime.

Finally, some VMS user interfaces, such as VAX DATATRIEVE, work with databases through a pass name supplied by VAX Common Data Dictionary (VAX CDD/Plus). Since each CDD/Plus path name has an associated access control list, it supplies an additional level of security.

Imagine the possibilities

While VIDA can be used to distribute subsets of data, its real beauty lies in its ability to perform selective interactive transfers of records and files. In fact, VIDA is optimised to handle selective queries of an IBM database. VIDA can transfer a single record or larger extracts from the IBM database to your VAX system.

VIDA for DB2 (IBM side) V1.0 SPD 25.E7

LICENCE	QB-VTXA9-BA	
MEDIA	QA-VTXAA-HA	6250bpi tape

VIDA for DB2 V1.0 SPD 25.E7

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VMS/SNA or DECnet/SNA Gateway, DECnet/SNA APPC/LU6.2 on VAX; MVS/XA, CICS/OS/VS V1.7, DB2 V1.3, DB2 Attachment Facility for CICS/OS/VS, SMP/E, Assembler H on IBM Mainframe. **Complementary Software:** DECdecision, Teamdata, VAX Datatrieve, VAX Data Distributor, Rdb/VMS Development, Rdb/VMS Interactive, VAX ACMS and any other product that can access a DSRI compliant database. **Installation:** 3,000 blocks (1.54 Mb) **Operation:** 1,900 blocks (.97 Mb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-VTWA9-J	MEDIA	QA-VTWAA-H
DOCS	QA-VTWAA-GZ		

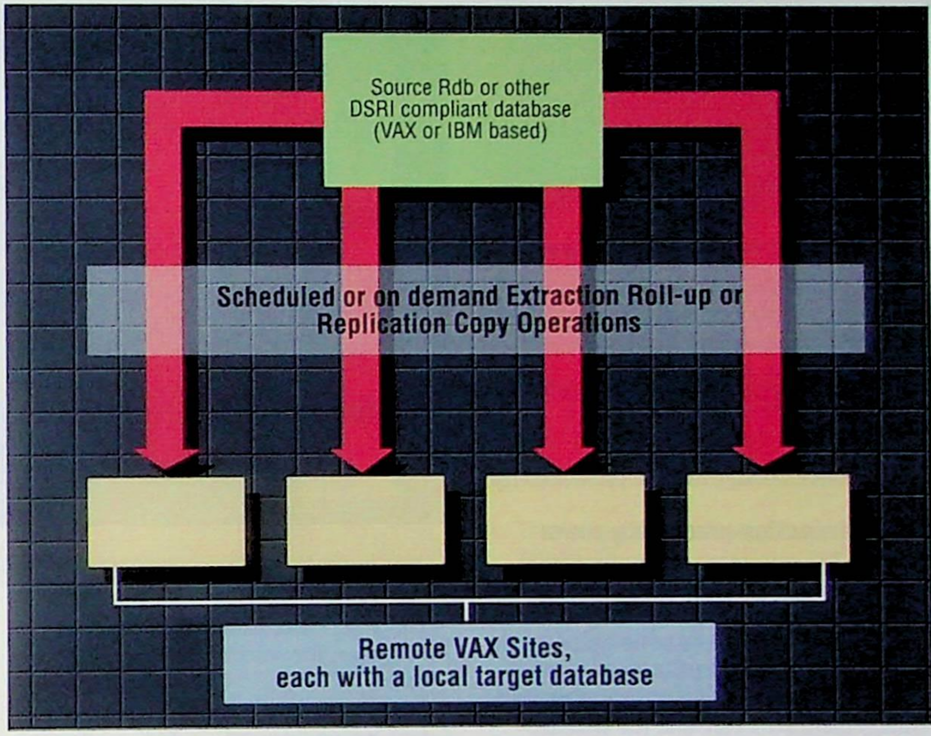
VAX Data Distributor

MOVING DATA TO WHERE YOU NEED IT

VAX Data Distributor is an automated data access tool that enables database administrators to transfer data subsets to other systems via DECnet. Running on any VMS system, VAX Data Distributor makes it possible for users anywhere in your enterprise to have local copies of the organisation's central databases.

VAX Data Distributor's automated, networked transfer of data provides benefits for systems managers and for users. By running applications on a copy rather than the central database, users obtain:

- Reduced query response time.
- Reduced contention for access.
- Minimal dependence on phone lines.
- Reduced network load.
- Fewer queries to any single database.
- An increase in the number of possible users.



Who uses VAX Data Distributor?

VAX Data Distributor is designed for use by database administrators with the appropriate data access privileges. Distribution can be set up in advance via the familiar Relational Database Operator (RDO) interface of VAX Rdb/VMS. All parameters of the operation, including the data to be distributed, the type of copy to be made, the target machine, and the transfer and update schedules can be specified with VAX Data Distributor commands.

To transfer databases between machines, VAX Data Distributor need only be installed on one machine. The other machine should have, at minimum, a copy of VAX Rdb Runtime loaded. The licence for Rdb Runtime is provided with VMS, so only the media kit need be purchased.

With VAX Data Distributor, you can:

- Give a database administrator precise control of the distribution process, with the ability to specify what should be distributed and when it should be distributed. The same database can be the source for different transfers of different types.
- Distribute data from any VAX Rdb/VMS, VIDA (Digital's data access tool for IBM databases), or other database conforming to the Digital Standard Relational Interface (DSRI).
- Distribute the entire database or a specified subset of it, as well as the associated metadata. Each transfer can have its own schedule and be run with different frequencies.
- Create one copy or several, each containing a different subset of data and tailored to the needs of a specific group of users.
- Use command procedures written in Digital Command Language (DCL) to perform many pre- and post-transfer tasks.

Types of Transfer available

Extraction: a copy from a source database to a target Rdb/VMS database. Data is made local to users, where it can be read and updated without adding to the load on the central main database and its accessing processor.

Extraction Rollups: As Extraction, except that this type of transfer consolidates data from multiple source databases into one target Rdb database.

Replication: sends only the changes to the source database since the last transfer. This removes the need for the target database to be rebuilt whenever it needs to be brought up to date.

New in V2.2

VAX Data Distributor now provides SQL support in transfer requests, in addition to the traditional VAX Rdb Relational Database Operator (RDO) user interface.

Secondly, IBM DB2 databases can be accessed through VIDA, with DB2 as the source database. Information entered into a DB2 database can be transferred into an Rdb/VMS database and used in an application on the VAX. Using an extraction rollup, data from IBM DB2 and Rdb/VMS databases can be combined.

VAX Data Distributor V2.2																SPD 27.76
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System **Installation:** 2,800 blocks (1.4 Mb) **Operation:** 2,300 blocks (1.15 Mb).

	TK50 **5** Tape **M**
MEDIA	

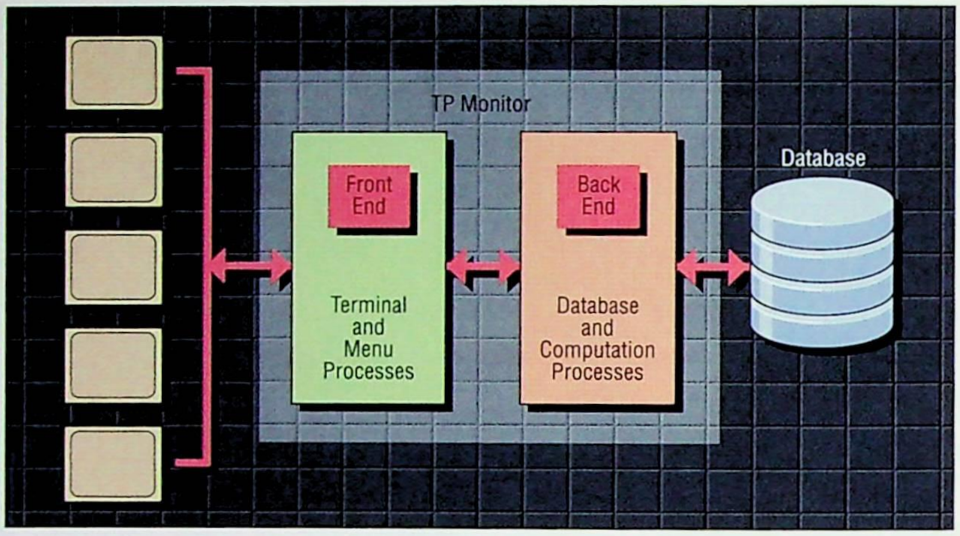
LICENCE	**QL-VDRA9-J**	MEDIA	**QA-VDRAA-H**
DOCS	**QA-VDRAA-GZ**		

VAX ACMS

OPTIMISE YOUR TRANSACTION PROCESSING SYSTEM

The VAX ACMS Application Control and Management System (ACMS) is a software package for developing, controlling, and running transaction processing (TP) applications. You can use ACMS and the VMS information management products to create a transaction processing development and run-time system that:

- Makes the most of your system resources.
- Gives you flexibility in how you access data and run your application.
- Provides data and transaction integrity.
- Improves programmer productivity.



ACMS at work.

More transaction-processing power

VAX ACMS minimises system overhead and database contention in any large on-line application involving a large number of users sharing data on the same system at the same time. ACMS controls the flow of transactions, and is independent of the data management structure and the systems which capture data and process forms.

VAX ACMS can off-load the collection of transactions onto a separate VAX processor. This can double the application throughput and provide failover capability for greater application availability. This is possible without rewriting application code because of the extensive ACMS application control facilities. ACMS conforms to the DEC Distributed Transaction Architecture (DDTA).

ACMS terminal and menu functions run in processes that are separate from database or file processing and computation functions.

Development, control and management

With VAX ACMS you can:

- Develop ACMS applications:
  - Describe, using a high-level definition language, the work or task(s) a user needs to do.
  - Define access and control characteristics for users and devices.
  - Set up or change menus that let terminal users easily select the tasks they want to run.
  - Employ terminal user commands to run tasks, get help information, and exit ACMS.
- Control the ACMS run-time system:
  - Control what resources are available to process the tasks in an application.
  - Change system parameters at runtime, 'tuning' your usage of system resources.
- Manage ACMS applications:
  - Monitor and record system activity, application use, and performance.
  - Control the startup and shutdown of applications.

ACMS ensures consistency of data if your system, or part of it, goes down. It provides data integrity through full database journalling and recovery facilities. It also has its own queue-management system of deferred transaction processing which makes it possible to recover entries without re-typing the information at a terminal.

Coming in ACMS V3.2

ACMS V3.2 will include:

- DECdtm (Digital's Distributed Transaction Manager) support, which implements the two phase commit protocol for multiple databases.
- Support for the VAXft 3000.
- Support for DECforms V1.2 in addition to the current support of TDMS. DECforms complies with the proposed FIMS (Form Interface Management System) standard.
- Support for DECtrace V1.0 and RdbExpert V1.0.

VAX ACMS V3.1 — SPD 25.50

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0 or later, VAX CDD-PLUS V4.1 or later. **Installation:** 24,000 blocks (12.3 Mb) **Operation:** 16,900 blocks (8.7 Mb).

	TK50 **5**	Tape **M**
MEDIA	1109	1109

LICENCE	QL-079A9-J	MEDIA	QA-079AA-H
DOCS	QA-079AA-GZ		

VAX ACMS Runtime V3.1 — SPD 25.50

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0 or later, VAX CDD-PLUS V4.1 or later. **Installation:** 23,100 blocks (11,8 Mb) **Operation:** 17,000 blocks (8.7 Mb).

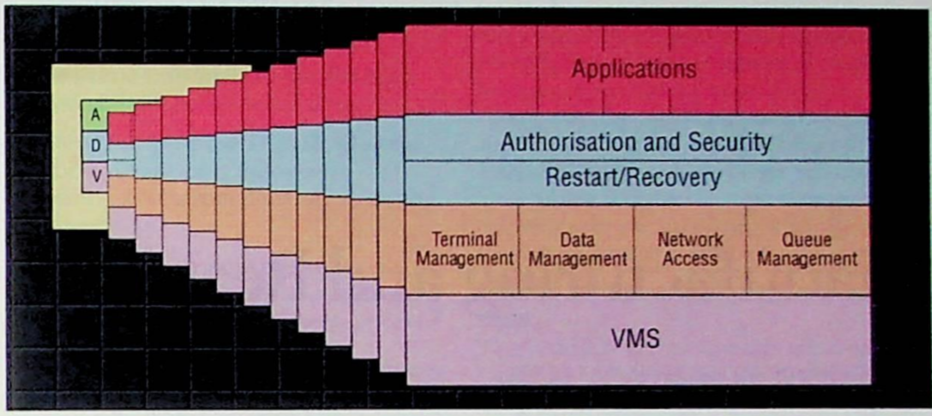
	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-076A9-J	MEDIA	QA-076AA-H
DOCS	QA-076AA-GZ		

DECintact

DECintact is a high-performance transaction processing monitor that performs services such as managing the terminal network, controlling access to the databases, recovering the databases, and ensuring the system's security.

- Runs on the full line of VAX systems.
- Integrates with application code written in 3GL languages including COBOL, C, BASIC, FORTRAN, PASCAL and PL/1.
- Provides an application-independent restart/recovery system, incorporating roll-forward and/or transaction backout journalling.
- Comprehensive security features, including one-way encrypted passwords, geographical restrictions and hours-of-operation definitions.
- Exceptionally well integrated terminal forms manager.



DECintact offers a traditional 3GL approach for building mission-critical TP applications.

Terminal management

DECintact's terminal-management sub-system handles all the I/O between user and application. The subsystem can be run on a different VAX system from the applications, enabling you to distribute terminal-management activities across a network.

Security and Network management

DECintact's dispatcher sub-system controls the security of the transaction-processing system. It screens users at several layers, beginning with the DECintact system password, and then by other attributes determined by the system manager. The authorisation file within the dispatcher sub-system gives a user access only to those applications and features that the system manager or security manager has enabled for that user. To deter unauthorised access further, a terminal profile that assures the geographical location of the user, entitled hours of operation, and other variables can be imposed.

File management

DECintact relies largely upon Digital's RMS (Record Management System) services for file management. RMS supports indexed, sequential, and relative file organisations. For increased performance, it provides hash file record access and can access records sequentially, randomly, or by record file address (RFA).

Restart/recovery management

DECintact's file-and queue-management systems work in conjunction with the restart/recovery facilities. And all file and recovery operations can be clustered: through VAXcluster system redundancy schemes, users can create a highly available transaction-processing environment.

Coming in DECintact V2.0

DECintact V2.0 will include:

- The introduction of support for VAX Rdb/VMS
- DECdtm (Digital's Distributed Transaction Manager) support, which implements the two phase commit protocol for multiple databases.
- Support for the VAXft 3000 fault tolerant computer system.
- Support for DECforms V1.2 in addition to the built-in DECintact forms subsystem. DECforms complies with the proposed FIMS (Form Interface Management System) standard.
- Support for DECtrace V1.0 and RdbExpert V1.0, allowing you to design DECtp applications for optimum performance, now and as your transaction system evolves.

The future of TP — with Digital

Your transaction processing needs will, like your business, change over time. With Digital and DECintact, your investment in transaction-processing is secure, and able to evolve to meet your future needs.

DECintact V1.1 — SPD 29.58

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0 or later. **Installation:** 33,000 blocks (16,896 Kb) **Operation:** 32,000 blocks (16,384 Kb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-VF1A9-J	MEDIA	QA-VF1AA-H
DOCS	QA-VF1AA-GZ		

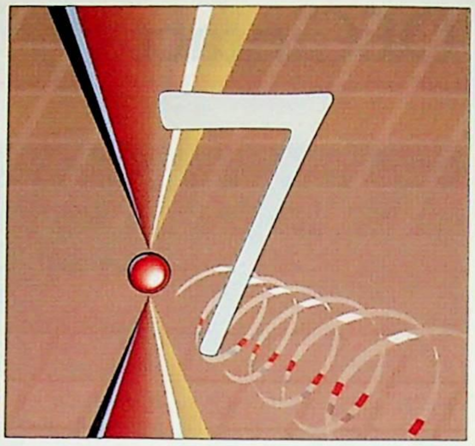
DECintact Runtime V1.1 — SPD 29.58

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0 or later. **Installation:** 33,000 blocks (16,896 Kb) **Operation:** 32,000 blocks (16,384 Kb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	QL-VF2A9-J	MEDIA	QA-VF2AA-H
DOCS	QA-VF2AA-GZ		



Manufacturing and Realtime

Realtime computing applications pose special challenges, demanding fast response times and predictable performance. For more than twenty years, Digital has led the way with solutions to realtime needs in industrial applications.

Realtime computing is rarely an isolated activity. Usually, it's only one element of your computing needs; even in dedicated or embedded realtime applications, it is usually necessary to do further analysis, reporting or communication of the resulting information.

The Digital difference is the way in which such realtime systems integrate with the rest of the enterprise, shaping themselves to your needs. The products over the next few pages are the enabling technologies on which such integrated systems are built.

Further information on a wide range of complementary software products and related services are available on request.

VAXELN

A NEW WINDOW TO REALTIME

VAXELN gives you the ability to write software and have it run on a dedicated machine without an operating system being present. This is particularly useful in realtime environments, where predictability of response time and speed of service are all-important.

The latest version of VAXELN offers:

- High-level implementation language support including an optimised ANSI/ISO Pascal compiler with realtime extensions, as well as runtime libraries for Pascal, VAX C, and VAX FORTRAN.
- Full DECwindows V2.0 client/server functionality, combining DECwindows server graphics capability with realtime application services on the same system.
- A Set Host capability, with which dedicated target users can access an interactive session with another Digital computer running VMS or ULTRIX operating systems.
- Support for Digital colour VAXstations as DECwindows devices.
- Multi-tasking and multi-programming support, tightly coupled symmetric multi-processing on the multi-processor VAX systems.
- V4.1 adds support for rtVAX 300, VAX 6000 Model 410 to 460 computers, plus all VAXserver 3000/6000 processors as targets.
- Symbolic debugging of application from remote host or local target system's console terminal.
- Pre-generated device drivers for a wide range of Q-bus, SCSI, UNIBUS and VAXBI devices, including mass-storage devices.
- Realtime terminal service for high speed, LAT based serial lines.
- New! Support for TCP/IP, plus the ability to support failover in multiple Ethernet controllers on the target system.
- 'RAM Disk' driver reserves and utilises VAX memory as a solid-state disk device, a feature also supported by VAX Rdb/ELN.

Generating reliable realtime applications — fast

The VAXELN Toolkit provides you with the development resources required to write efficient, realtime code. It includes an extended Pascal compiler and runtime library, the kernel executive, system services and I/O device drivers, a system image builder, and a remote symbolic debugger. Runtime libraries with multi-programming realtime extensions for VAX C and VAX FORTRAN are included in the VAXELN Toolkit.

With DECwindows support, the VAXELN Toolkit lets you develop dedicated, realtime applications featuring network-transparent, graphics-oriented user interfaces.

Utilities to monitor and analyse system resources and performance, as well as error logging and user authorisation packages, are included with the VAXELN Toolkit. The VAXELN Ada development and runtime environment, and compilers for VAX C, VAX Ada, and VAX FORTRAN are available under separate licences. For applications requiring database-management capabilities, the VAX Rdb/ELN relational database software package is also available under separate licence.

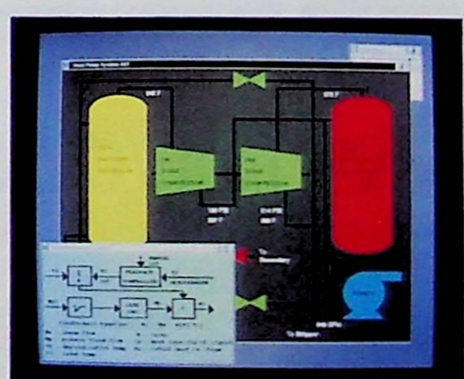
Once you have built the application, you can load it into the target computer for execution, either from the host computer via an Ethernet link or from local mass storage such as disk or magnetic tape. Along with the usual components of the application, you can include either of the VAXELN debuggers in the system image for trouble-shooting the target computer remotely over the Ethernet, or locally via the target's console terminal.

VAXELN kernel controls tight execution code

The VAXELN kernel supports multi-tasking capability and also allows you to declare parts of a program to be scheduled for concurrent execution with the main program. In fact, several tasks, known as 'processes', can execute concurrently. The kernel's multi-programming feature allows you to schedule more than one program, for concurrent execution on the same target CPU.

Local area transport host services

The VAXELN Toolkit includes local area transport (LAT) host services that VAXELN systems can use to communicate with devices attached to terminal servers.



VAXELN now allows development of realtime applications that capitalise on local or remote colour DECwindows display.

VAXELN Toolkit V4.1												SPD 28.02				
CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System. **Complementary Software:** Rdb/ELN, and the complete portfolio of Digital Program Development and Database access tools, VAX C, VAX Fortran, VAXELN Ada. **Installation:** 40,000 blocks (20 Mb) **Operation:** 32,000 blocks (16.5 Mb).

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-375A9-J**	MEDIA	**QA-375AA-H**
DOCS	**QA-375AA-GZ**		

VAXELN Runtime V4.0															SPD 28.02						
TRADITIONAL	R	Q	C	P	N	M	L	K	S	J	H	B	2	G	F	E	3	4	D	U	V	5
LICENCE PRICE																						

Product size depends solely on the size of your generated application.

	TK50 **5** Tape **M**
MEDIA	

LICENCE	**QL-376A -FA**
DOCS	**QA-376AA-GZ**

VAXELN Ada

FOR REALTIME VAX TARGETS

VAXELN Ada is a VMS layered product for developing Ada language applications which run in a stand-alone or embedded environment on VAX processors under the VAXELN real-time executive. VAXELN Ada is especially suited to creating real-time applications in which the system's response to external events is critical.

VAXELN Ada applications are developed using VAX Ada and the VAXELN Toolkit on a host VMS system. The resulting bootable, VAXELN-based Ada application is then moved to the VAXELN target system using disk or tape media, an Ethernet Local Area Network (LAN) link, or programmable read-only memory (PROM).

VAXELN Ada, in combination with VAX Ada and VAXELN, has been validated as fully conforming to ANSI/MIL-STD-1815A-1983 (Reference Manual for the Ada Programming Language) by the Ada Joint Program Office.

System features and special extensions

VAXELN Ada applications are compiled with the Ada compiler supplied with the VAX Ada product. The choice of target system can be deferred until the application is linked.

VAXELN Ada supports all VAX Ada features except:

- Access to relative and indexed organisation files. The VAX Ada packages RELATIVE_IO, RELATIVE_MIXED_IO, INDEXED_IO and INDEXED_MIXED_IO are not supported.
- Support of the VMS Asynchronous System Trap (AST) mechanism
- Timeslicing: VAXELN Ada tasks run until blocked or preempted.

Symbolic Debugging

A high-level, fully symbolic remote debugging capability is provided. This feature requires that the user has the optional DECnet-VAX licence and a link between the host and target systems. It can be used to debug remote applications from a programmer's terminal on a VMS system.

VAXELN Ada V2.0 SPD 27.22

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System V5.0 or later, VAXELN Development Environment V3.1 or later, VAX Ada Compiler V2.0 or later. **Complementary Software:** Rdb/ELN, DECscan ELN Driver, VAX C, VAX Fortran. **Installation:** 8,000 blocks (4,096 Kb). **Operation:** 6,000 blocks (3,072 Kb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-A97A9-J**	MEDIA	**QA-A97AA-H**
DOCS	**QA-A97AA-GZ**		

VAX Rdb/ELN

DATABASE FOR REALTIME APPLICATIONS

VAX Rdb/ELN is a relational database management system designed for dedicated applications on systems running in the VAXELN application environment. Rdb/ELN features include:

- Data Definition Language Compiler (ERDL), used to define databases, relations, views, fields, and indexes.
- Ability to restructure databases on-line, without unload/reload.
- Data Manipulation Language (DML), which uses block structured data manipulation statements, similar to VAX DATATRIEVE.
- Can access multiple databases in the same program, including bottle-necks local or remote (including Rdb/VMS databases!).
- Data Dictionary which stores data definitions in the database file as relations.
- Database Utilities, including Logical backup/restore.
- Conversion utility for moving from the host development environment to a target (Run-Time) environment, or for migrating to a VAX Rdb/VMS database.
- Relational Database Query Language (ERQL), which supports all data manipulation operations in both development and target environments.
- Concurrent access by multiple applications to the same database.

VAX Rdb/ELN implements the DIGITAL Standard Relational Interface (DSRI). DSRI allows applications running on any VAX node in a DECnet network to access all other DSRI compliant databases in the network, such as VAX Rdb.

VAX Rdb/ELN applications are developed using the VAXELN Toolkit on a host VMS system. The resulting bootable, VAXELN-based Rdb/ELN applications are then moved to the VAXELN target system using disk media or an Ethernet LAN link. The application program executes on the target system as a dedicated database system. The network link to the host development system can be used for remote debugging.

VAX Rdb/ELN V2.2A SPD 28.03

CLUSTERWIDE	B	C	D	E	F	G	H	J	K	L	M	N	Q	S	T	U	V
LICENCE PRICE																	

Required Software: VMS Operating System, VAXELN development kit, DECnet-VAX. **Complementary Software:** Any DSRI compliant database tool or database access application, EPASCAL, VAX C, VAX Fortran, VAXELN Ada. **Installation:** 8,800 blocks (4,400 Kb). **Operation:** 7,300 blocks (3,650 Kb).

	TK50 **5**	Tape **M**
MEDIA		

LICENCE	**QL-D07A9-J**	MEDIA	**QA-D07AA-H**
DOCS	**QA-D07AA-GZ**		

VAX DECscan VMS and ELN Bitbus Drivers

BITBUS™ CONNECTIONS

DECscan connects a supported MicroVAX or Industrial VAX configuration to a wide variety of industrial measurement and control devices which use Intel's BITBUS® open architecture interconnect. This is achieved in conjunction with the IBQ01 Q-Bus interface.

DECscan comes in two parts: a set of drivers for use with VMS and VAXELN, plus a toolkit to give the lay user complete control over the BITBUS™ configuration – without programming.

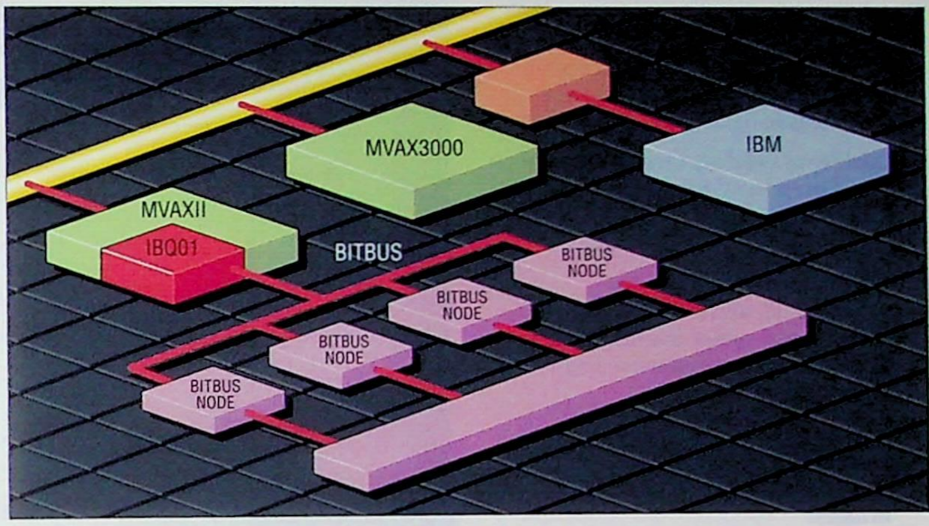
The DECscan Driver software consists of:

- A MicroVAX VMS Device Driver and User Interface Program, for use with up to eight IBQ01 Q-Bus interfaces per system.
- A VAXELN Driver, allowing target VAX processors to be downloaded with an BITBUS handling application, without the need for a local operating system.
- An 8044 cross-assembler and support utilities, allowing the user to develop application tasks that run on 8044-based BITBUS Nodes loaded from VMS or VAXELN hosts.

The MicroVAX VMS driver, along with a user-interface program, allows the user to access a BITBUS system either through a program, or interactively. The MicroVAX VMS user-interface provides the user with the ability to configure the system and test its responses for calibration purposes.

The VAXELN driver allows the user the ability to build finished VAXELN systems, on any VMS Host system, using the VAXELN toolkit. The finished VAXELN system is then down-line loaded to MicroVAX target systems, where it runs without the presence of another operating system. VAXELN is especially suited to creating real-time applications in which the system response speed and predictability to external events is critical.

The ELN target systems may be diskless and down-line loaded via Ethernet using DECnet protocols, or permanently resident in the ELN target systems using erasable, programmable, read-only memories (EPROMs).



DECscan gives the VMS user access to Intel BitBus® compatible peripherals.

VAX DECscan VMS Software Toolkit

The DECscan VMS Software Toolkit offers:

- An operator menu interface for control both configuration and of all types of supported I/O
- Alarm handling and reporting
- Data acquisition through local addressing
- Basic closed loop regulatory control
- A consistent runtime interface that may be called from your application code, on either local or a remote DECnet-VAX host
- Online Help

Typical applications for the Toolkit include factory floor monitoring and automation, remote high-speed data acquisition and control, product handling, environmental control, etc. In such applications, the Toolkit allows the user to set-up the monitoring and control activity with no coding required. Application specific requirements, such as data archival and custom graphic displays, require custom programming and/or separate utilities. One such graphics tool, integrated via the callable interface provided, is the DataViews™ (DV-Draw and DV-Tools) industrial graphics package, sold by:

V.I. Corporation (Europe) Ltd.,
First Base, Beacontree Plaza,
Gillette Way, Reading, Berkshire.
Telephone: (0734) 756010.

DIGITAL does not sell nor technically support DataViews.

DECscan Bitbus Toolkit V2.1		SPD 26.98
LICENCE	**QL-VCSAA-AA**	
MEDIA	**QA-VCSAA-H5**	(TK50)
or	**QA-VCSAA-HM**	(Tape)

Software Requirements: VAX DECscan VMS & ELN BITBUS Drivers. **Programming Languages:** VAX Ada, VAX BASIC, VAX BLISS-32, VAX C, VAX FORTRAN, VAX PASCAL, VAX PL/1. **Installation:** 8400 blocks (4200K bytes). **Operation:** 3300 blocks (1650K bytes).

DECscan VMS & ELN Drivers V2.0		SPD 27.98
LICENCE	**QL-VCJAA-AA**	
MEDIA	**QA-VCJAA-H5**	(TK50)
or	**QA-VCJAA-HM**	(Tape)

Software Requirements: VAX/VMS Operating System V5.0 or later. ELN Drivers require VAXELN V3.0 or later. **Hardware Requirements:** IBQ01 DECscan (BITBUS) controller board. **Programming Languages:** The appropriate driver can be called from any language supported by the native host environment. VMS Driver: **Installation:** 863 blocks (442Kb), **Operation:** 528 blocks (270Kb). ELN driver: **Installation:** 863 blocks (442Kb), **Operation:** 571 blocks (292K bytes).

DECview 3D

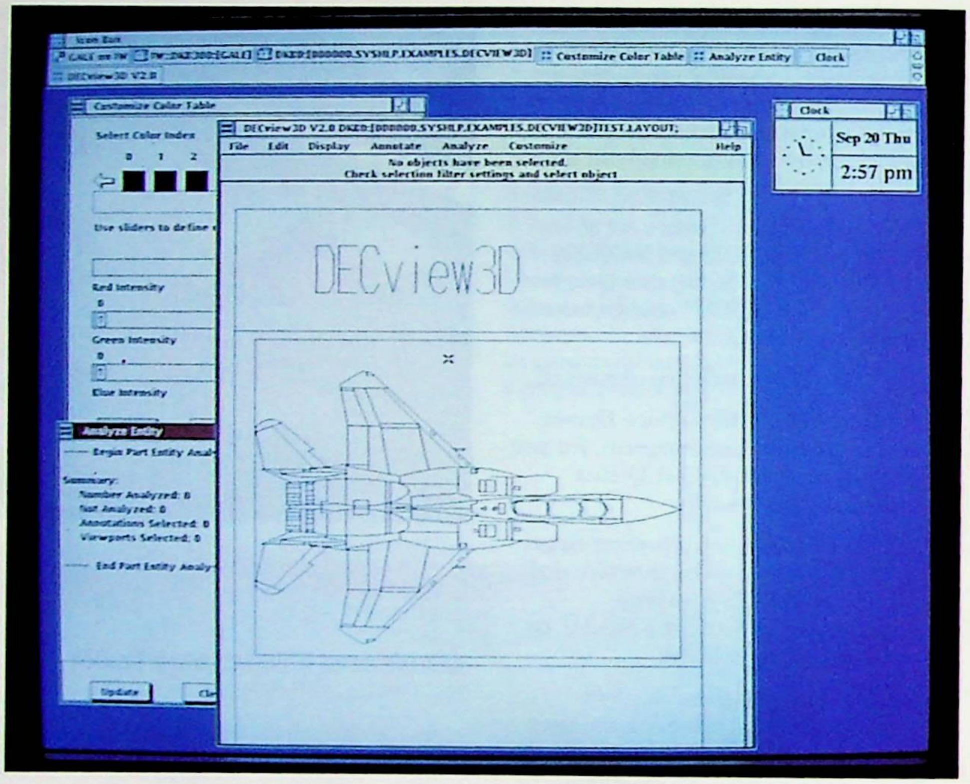
EASY ACCESS TO ENGINEERING GRAPHICS

DECview 3D is a VMS application that provides easy access to existing 3D and 2D engineering graphics by different groups within an organisation. Its key features include:

- Ability to read and translate files formatted in IGES (Initial Graphics Exchange Specification), HP-GL and CalComp 960 plot formats.
- Geometry information is maintained, allowing the user to control and query the data using DECview's manipulation and analysis features.
- Display/Manipulation operations include PAN, ZOOM and 3D ROTATE features on multiple images.
- Annotation. Engineering graphics displayed in DECview 3D can be highlighted by adding text, symbols or other graphical objects to the layout. A library of twelve engineering/manufacturing symbols is provided.
- Analysis. The part entity function allows the user to obtain information on the geometry and coordinates of an engineering entity in the graphic.
- Working with other applications. DECview 3D can be used as a companion product with many other applications. For example DECview 3D can be used as a LiveLink™ application running with the DECwrite documentation system to produce technical compound documents.

Engineering graphics are files created by different CAD systems and may include drawings, designs, plots or engineering parts. DECview 3D enables both technical and novice users to prepare these engineering graphics for inclusion in technical compound documents such as process plans or engineering proposals, or to review engineering designs that are under development.

Digital's DECview 3D software, an application for VMS systems running the DECwindows interface, pulls CAD designers into the concurrent engineering process.



DECview 3D makes creating compound documents eaiser.

CAD designs no longer need to be confined to CAD systems.

With DECview 3D, two-dimensional and three-dimensional graphics files can be shared among different users and integrated with applications downstream from engineering design. CAD graphics can be viewed and manipulated on DECwindows workstations, DECwindows terminals, and low cost graphics terminals (including VT240, 330 and 340 ReGIS terminals).

DECview 3D V2.0		SPD 26.95
LICENCE	QL-796A9-PB	
MEDIA	QA-796AA-H5	(TK50)
or	QA-796AA-HM	(Tape)

Required Software: VMS Operating System. **Complementary Software:** Any CAD/CAM Application that generate IGES files, VAX/VTX Videotex System, ALL-IN-1 Office Information System. **Installation:** 6200 blocks (3100 Kb). **Operation:** 5700 blocks (2850 Kb).

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Index by Part Number

UPI = Unique Product Identifier. Used in the Part Number as follows: **QL-XXXXX-XX**

SPD = Software Product Description

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General Index *(continued)*

NOTES

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- מחוללי יישומים
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Digital Equipment (Dec) Ltd.
Digital House, Accadia Junction
46733 Herzliya
Israel
P. O. Box 2033
46120 Herzliya

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